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Vol. 3

Susanna Newman

1807

THE

DOMESTIC ENCYCLOPÆDIA;

OR, A

DICTIONARY OF FACTS,

AND

USEFUL KNOWLEDGE:

COMPREHENDING

A CONCISE VIEW OF THE LATEST DISCOVERIES,
INVENTIONS, AND IMPROVEMENTS, CHIEFLY
APPLICABLE TO RURAL AND DOMESTIC ECONOMY;

TOGETHER WITH

DESCRIPTIONS OF THE MOST INTERESTING OBJECTS OF NATURE AND ART;
THE HISTORY OF MEN AND ANIMALS, IN A STATE OF HEALTH OR
DISEASE; AND PRACTICAL HINTS RESPECTING THE ARTS AND
MANUFACTURES, BOTH FAMILIAR AND COMMERCIAL.

Illustrated with numerous Engravings and Cuts.

IN FOUR VOLUMES.

VOLUME THIRD.

BY

A. F. M. WILLICH, M. D.

AUTHOR OF THE LECTURES ON DIET AND REGIMEN, &c. &c.

LONDON:
PRINTED FOR MURRAY AND HIGHLEY, 32, FLEET-STREET; VERNOR AND
HOOD, POULTRY; G. KEARSLEY, FLEET-STREET; H. D. SYMONDS,
AND THOMAS HURST, PATERNOSTER-ROW; AND THE AUTHOR.

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ERRATA et CORRIGENDA.

Page 37,	Col. 2,	line 5,	for harshness, read hardness.
—— 96,	—— 1,	——	The last period in the first paragraph of the article Light, should be thus corrected: "And as the space equal to the diameter of the Earth's Orbit, is 180,000,000 miles, the rays of the Sun travel one half of that vast distance, namely, 90,000,000 miles in 8¼ minutes, before they illumine our Earth."
—— 122,	—— 2,	—— 27,	for such, read, those.
—— 133,	—— 2,	—— 27,	after the word, breathing; add, a "small and quick pulse attended with a violent fever."
—— 269,	—— 1,	—— 37,	for Pickling, read, Pickle.
—— 339,	—— 1,	—— 30,	for gass, read, gas.

THE

DOMESTIC ENCYCLOPÆDIA.

JET, a black inflammable concrete, which becomes electrical by friction; attracts light substances, in the same manner as amber, and, when burning, emits a bituminous smell. It has the grain of wood, is but moderately hard, and splits most easily in a horizontal direction.

Jet is always found in detached masses, lodged in other strata; it abounds no where so plentifully as in England, being very common in Yorkshire, and other northern counties, though it is also discovered in many clay-pits about London. Ireland, Sweden, Prussia, Germany, and other parts of Europe, as well as the East Indies, produce this fossil. It admits of a high polish, and is chiefly converted into small boxes, buttons, bracelets, and other toys. In conjunction with oils, it forms an ingredient in varnishes; and, when mixed with pulverized lime, it is said to produce a hard and durable *cement.*

ILIAC PASSION, or *Ileus*, one of the most dangerous maladies with which mankind is afflicted, and in which the motion of the bowels is totally inverted. It generally arises from spasms, or obstructions in the alimentary canal, by which the passage or descent of the excrements is impeded; an unnatural stricture of the intestines, ruptures, &c.; violent exertions of the body, such as leaping, running, or riding; the lifting of great weights; eating of unripe fruits, especially pears and nuts; the drinking of sour and ill-fermented liquors; the use of too strong laxatives, worms, and obstinate costiveness, are among the many causes which generate this fatal disorder.

Where the iliac passion proceeds from a distortion of the intestines, there is little hope of recovery. Various remedies, however, have been used, with different degrees of success. Thus, large blisters applied to the most painful part, while emollient clysters are injected; fomentations; camphor externally and internally; ipecacuanha in the smallest doses frequently repeated; linseed oil, both in small draughts, and in the form of clysters; as well as the warm bath, have all been found sometimes of service, but more frequently unavailing. And though experience has but too often evinced, that this obstinate disorder is not under the control of medicine, yet it may, in many instances, be arrested in its progress, and perhaps eventually cured, when a just *diagnosis* can be formed of its nature.—The writer of these pages had lately an opportunity of seeing the most inveterate iliac passion, with all its horrors, in an aged patient whose memory he reveres; but who, in consequence of constant nausea, hiccough, and vomiting, could not be prevailed upon to take those appropriate medicines which *might* have been attended with the desired effect. On this occasion, several of the most experienced practitioners in the metropolis were consulted, one of whom was bold enough to prescribe a combination of *arsenic* and *hemlock*, with a view to effect such a change in the whole alimentary canal, or to stimulate Nature to such exertions, as appeared to be necessary for removing a *supposed* cancer of the colon, or the largest of the intestines. Unfortunately, however, this powerful medicine produced the most alarming prostration of strength, such as might have been expected in a patient who was already reduced to a state of exhaustion and despair. Hence we are firmly persuaded, that, in similar cases, no other remedy can with advantage and safety be employed, than frequent doses of *castor-oil*; and, if this fail to procure relief, that *quicksilver*, in a native state, is the only medicine on which any reliance can be placed. Had these simple means been adopted, we venture to pronounce, that the life of our venerable patient would, in all probability, have been protracted.

The diet of patients affected with the iliac passion, ought to consist of very light food, taken in moderate quantities, and neither too warm nor too cold. Wines, spirits, acrimonious and irritating substances, as well as heating liquors, ought to be carefully avoided; because they are always productive of bad consequences. Thin gruel, prepared from barley or oatmeal, or weak chicken broth, are equally proper; and the patient's drink ought to consist of decoctions of emollient vegetables, or water in which toasted bread has been boiled, or clear whey.—Particular attention ought also to be paid to the mind, which should be preserved in a state of cheerfulness and serenity.

IMPATIENT. See BALSAMINE.

IMPLEMENTS *of Husbandry*, denote those machines or instruments which are used in the different branches of rural and domestic economy; such as ploughs, harrows, hoes, churns, threshing-machines, straw-cutters, &c.

The improvement of husbandry, by the construction of more perfect implements, calculated to facilitate its operations, has within the last fifty years become an object of general attention; and, with this view, the patriotic agricultural societies, especially those of Britain, have granted liberal premiums to the inventors of useful and ingenious machinery, on condition that such contrivances should be communicated for the benefit of the public. Much, however, remains to be done in this important department of economy; which, we apprehend, will not be carried to its relative degree of perfection, *till the science of husbandry form a more leading part of education at public schools.* The ancients have bequeathed to us a variety of excellent and classical books on the subject: hence it were sincerely to be wished, that, by accurate translations of these works, accompanied with critical and explanatory notes, by professional farmers, the study of agriculture may be revived, and thus our knowledge of this important science progressively enlarged.

Lately, indeed, a repository for agricultural implements has been opened in the vicinity of Hanover-square, we believe, under the inspection of Mr. MARSHALL, whose name we have had frequent occasion to mention in the progress of the present work. This repository is daily open to the view of the public, at a trifling expence; and, we understand, is designed to contain models and specimens of the most valuable and practical improvements in husbandry: by such an institution, we trust that the prejudice in favour of antiquated, and aukward implements, will be gradually vanquished.—Several societies of agriculture have lately been re-established in France, and they have devoted their attention more especially to this interesting subject. *Ploughs*, adapted to different soils, are doubtless the most essential requisites to the successful management of a farm; and several of these primary implements having recently been contrived, which promise to be eminently useful, we shall give an account of their construction, illustrated with such cuts as may appear necessary, under the article PLOUGH.

IMPOSTHUME. See ABSCESS.

INARCHING, in gardening, is a method of engrafting, denominated *grafting by approach*; and is employed when the stock intended to graft on, and the tree from which the scion is to be taken, are situated so near that they may be easily joined.

This operation is performed in the month of April or May, in the following simple manner: The branch designed to be inarched, is exactly fitted to that part of the stock with which it is to be united, after having previously pared away the rind and wood on one side of both the stock and branch, about the length of three inches, that they may uniformly combine, and thus promote the circulation of the juices. A little tongue is then cut upwards in the graft, and a notch made in the stock for inserting it; so that when they are joined, the tongue will prevent their slipping, and the graft more closely adhere to the stock. They are next tied with some bass, or worsted; and, to exclude the air from the wounded part, it is covered over with grafting clay. Lastly, both the graft and stock are fastened to a smooth and proportionate stake, which is driven into the ground, in order to withstand the effects of high winds, that would otherwise displace them. After having remained in this situation about four months, they will be sufficiently combined, and the graft may then be separated from the mother-tree; sloping it close to the stock, and laying fresh clay around the wounded part.

Inarching is chiefly practised with oranges, myrtles, jasmines, walnuts, firs, &c. which do not flourish by the common mode of engrafting. It ought, however, on no account to be performed on such orange trees as are designed to grow to a considerable size; for they seldom *live long* after this operation.

INCLOSURES. See COMMONS, FENCE, and HEDGE.

Incubus. See Night-mare.

INDEX, in literature, expresses that part of a work, or single volume, which is generally subjoined to its conclusion, and arranged in alphabetical order, with particular references to the pages where the respective matters or subjects are discussed.

An *Index* should be distinguished from what is usually called, *Table of Contents*, which affords an analytical view of the different topics, progressively, while the index is intended to facilitate occasional reference. Both are useful: the former, to enable the reader to take a comprehensive survey of the whole work, and to appreciate at once the author's *logical* talents of dividing and arranging the subject of which he treats, as well as to form an idea of its extent and importance. In an *economical* respect, however, the latter is a more valuable addition to a book than an analysis of its contents, which are in a manner evident from the heads of chapters or sections; whereas an *index* tends to save time and labour, that are often unnecessarily wasted in searching for particular passages. Hence a large, ponderous volume, without an *alphabetical* index, may be aptly compared with an extensive street, or town, the houses of which are not provided with numbers.

Indian Berry. See Cocculus *Indicus.*

Indian Corn. See Maize.

INDIGESTION, or *Dyspepsia*, a complaint which chiefly consists in the loss of appetite, and is generally attended with nausea, flatulence, vomiting, heart-burn, costiveness, as well as other unpleasant symptoms, without any immediate affection either of the stomach or other parts.

Indigestion arises from a variety of causes, such as the eating of hard, unwholesome food, and unripe fruit; drinking too large draughts of liquor during, or immediately after dinner; the immoderate use of opium, and of spirits; taking too large quantities of tea, coffee, or any warm relaxing liquors; tampering with emetics or laxatives; the want of free air and exercise; and in consequence of indulging in any of the depressing passions.

Persons of weak, delicate habits, particularly the sedentary and studious, are frequently subject to indigestion. A radical cure of it can be effected only by removing the debility of the stomach and whole system. With this intention, emetics, or gentle purgatives, should be previously administered, in order to clear the alimentary canal. Next, tonics, such as valerian, Peruvian bark, &c. may be resorted to with advantage; and, if the complaint be accompanied with putrid eructations, or other signs of putrescency, it will be advisable to take the strongest *antiseptics*, especially the marine acid or spirit of salt, sufficiently diluted with water. Many, however, have been effectually cured by the *liberal* use of cold water alone. In great laxity of the stomach, considerable benefit has been derived from the use of the columbo root, in small and frequent doses.—The chalybeate waters are, to phlegmatic habits, in general, of great service; and the moderate drinking of sea water has often been productive of good effects.

Medicines, however, will be of

little or no advantage, unless the patient take moderate and daily exercise in the open air, and endeavour to preserve a cheerful, contented mind. Early rising ought to form an indispensable part of his attention; while his diet should consist principally of solid, but tender aliment, which he, from experience, has found easy of digestion.

INDIGO, a drug for dyeing blue, prepared from the indigo plant, or *Indigofera tinctoria*, L. a native of the warmer parts of Asia, Africa, and America.

Instead of describing the particular culture of this exotic, which cannot be raised with success, even in the hot-houses of our climate, we shall briefly point out the characters of the best indigo that is imported, and which has frequently undergone the various processes of adulteration with earth, ashes, and pounded slate.—The genuine drug ought to be of a rich dark blue colour, approaching to black, and, when broken, to display the lustre of copper: nor should it sink in water, or leave behind any sediment, after being dissolved. The purest indigo is brought from Guatimala, in South America.

Although large quantities of this dyeing material are annually produced in the British colonies, and thence imported, yet we might easily dispense with this costly drug, which, to the detriment of native productions, and especially that of WOAD, was first brought to Europe by the trafficking Dutch, about the middle of the 16th century. Indeed, there is every reason to believe, that many plants of English growth would yield excellent substitutes for indigo.—We have, in the progress of this work, already hinted at several vegetables of this description; and, as a repetition of their names and properties would be here superfluous (though incomplete, at the present letter of the alphabet) we shall purposely delay that useful task till the conclusion of our labours, when it will appear in the *General Index of Reference.*

Indigo is much used in washing, to impart a blueish cast to linen; painters also employ it as a water-colour; and dyers consume large quantities in the various tints of blue cloths.

In March 1797, a patent was granted to Mr. JOSEPH BARTON, chemist, for an improved method of preparing indigo for dyeing wool, &c. in a more perfect manner than has hitherto been discovered. As, however, this patent is not expired, and the process is too expensive to be attempted for the gratification of the experimenter, we refer the inquisitive reader to the 9th volume of the *Repertory of Arts and Manufactures*, where it is minutely described.

By the 36th Geo. III. c. 40, indigo and cochineal may be imported from any place, in British ships, or such as belong to friendly nations, free from duty, except that of convoy, until the 29th of September 1802, and to the end of the then next session of parliament.

INDUSTRY, *Houses of*, are buildings erected in various parts of England, in order to maintain the sick, infirm, and aged poor; while children and healthy adults, who are received into the house, labour for their support, and are allowed a certain part of their earnings, as an inducement to industrious habits.

These buildings, doubtless, contribute to the comfort of the poor, and are calculated to lessen the severe burthen of parochial rates: they conduce to the rearing of an healthy, honest, and virtuous race of peasantry. Of this patriotic tendency is the Shrewsbury House of Industry; which, being excellently adapted to the purpose, has given birth to many similar institutions lately formed in various parts of Britain. We are no advocates for the toleration of *beggars,* who, under the imposing appearance of misery, extort alms from credulous charity: nor is it consistent with good policy to tolerate those hordes of idlers and drunkards, especially in the metropolis; for numbers of such as do strictly belong to the list of *mendicants,* might be very properly committed to the work-house, under the description of *vagrants*; because they prey upon the vitals of a deluded public. On the whole, however, we are of opinion, that industry would be more effectually promoted, if the poor were allowed to retain their little independence, and encouraged to persevere in their honest endeavours, by small bounties, occasionally bestowed on them by the parish. At the same time, a comfortable provision might be made for the infirmities of age, by means of *friendly societies,* which, in the course of a few years, would supercede the necessity of building houses of industry. And, if those benevolent associations could be so organized that the rich and poor should contribute according to their respective abilities, we hesitate not to say, that the latter would be better assisted than they *can be* at present, on the irregular plan of parochial assessments, which, in too many instances, nearly *double* the rent of the premises. The opulent would become better acquainted with the *real* wants and miseries of the poor, while these would gradually acquire both principles and habits of industry: in short, they would thus be reconciled to their lot, and prosper under the management of the wealthy.

Many objections have been urged for and against houses of industry. Those readers who wish to peruse the arguments on both sides of the question, will derive equal amusement and information from Mr. Wood's pamphlet, entitled, *Some Account of the Shrewsbury House of Industry,* (8vo. 5th edit. 3s. 6d. Longman and Rees, 1800), in which several objections are ably answered.

INFANCY denotes the first period of human life, previous to the age of seven years.

Having already treated of the diet proper for infants, under the article Food, and of their amusements, under the head of Exercise, we shall at present offer only a few remarks, chiefly relating to their dress.

The most fatal period to infants is, doubtless, during the two first years of their existence; for it has frequently been observed, that greater numbers die under that age than at any subsequent stage of life. This mortality is supposed principally to arise from the erroneous practice of confining their tender bodies, as soon as they behold the light, by means of tight bandages, so that neither the bowels nor limbs have sufficient liberty to act, in the easy manner designed by Nature.—Another cause, which especially operates in country places, is the pernicious custom of feeding them with butter and sugar, oil of almonds, or similar unwholesome preparations.—See vol. ii. p. 319; the article FOOD.

In order to obviate the abuses before mentioned, the infant's dress should be so contrived, that it be neither too warm nor too tight, and that not only the influence of the air may have its full effect, but also the motion of the body be duly facilitated. Hence a roller, about six or seven inches broad, should be made, either of linen or woollen cloth, as the season may require, though a knitted bandage would be far preferable; as, from its more elastic nature, it may with less pressure or constraint be turned round its body. It would be superfluous to enumerate the other parts of the *upper dress*, as every judicious parent will readily accommodate it to age and circumstances. The head should be lightly covered; and, while travelling, in cold or hot weather, a cap or hat may be safely used, but again laid aside, as soon as the infant returns to the house, or to a mild temperature, where every compression of the head is useless, and frequently hurtful.—Indeed, the whole dress ought to be as loose as possible, because ruptures, and other fatal consequences, often originate from a contrary treatment.

Stockings are by many considered as unnecessary articles of the dress of infants; yet, as our offspring is not intended to go *bare-legged*, when adults, we conceive no reason for depriving them of proper hose, especially if they can be kept *dry*, and be adapted to the length of the foot, both in the winter and summer; though such covering will be more useful in the former season: their shoes also ought to be sufficiently wide.—See FOOT.

From the first moment of their existence, infants are liable to the attacks of disease. It deserves, however, to be remarked, that the descendants of sedentary, idle, nervous, or weak persons, are chiefly exposed; while those of the peasant and husbandman, being early inured to fatigue and hardships, are not only more healthy, but also less reduced by occasional indisposition, and better able to bear external injuries.—We cannot, in this place, enter into any details respecting the management of infantine disorders, as they are discussed in the alphabetical series. (See also vol. i. p. 257, *Vitiated bile*): hence we shall conclude these remarks with adding, that, 1. The dress of children ought materially to differ from that of adults: 2, No distinction ought to be made in the dress of either sex during the first years of infancy: and, 3. Let the dress of children be clean and simple, but never too warm.—See also SLEEP.

INFECTION, the communication or contraction of some disease, from the effluvia, which arise either from the sick, or from the apartment in which they reside: hence it does not necessarily imply actual contact.

Having already pointed out the proper means of avoiding personal infection, under the article CONTAGION, we shall at present confine our attention to the most efficacious method of preventing the propagation of infectious diseases.

This important object has lately been investigated with equal zeal and success by the patriotic Society for Increasing the Comforts, &c. of the Poor; from whose abridged *Account of the Cure and Prevention of Contagious Fevers in the Metropolis*, (8vo. 2d edit. 6d.) it appears that not less than *three thousand one hundred and eighty-eight persons have annually died*, upon an average (within the last hundred years) in consequence of infectious fevers.

The alarming increase of this malignant epidemic, is justly attributed to the close and confined dwellings of the poor, where the circulation of fresh air is almost entirely prevented. With a view to check such rapid progress, several benevolent members of the society above mentioned have formed a well-digested plan; in conformity to which, appropriate houses are to be opened, and provided with the requisite medical assistance of every kind, for the reception of such diseased poor as it may be deemed necessary to remove from their own habitations: others, in the meantime, will receive professional advice at home, and be regularly visited by the physician appointed for that purpose.—This laudable establishment is supported by subscription; and, we trust, from the known liberality of Britons, that it will never fail for want of effective support.

In places where infection has actually prevailed, the necessary precautions are immediately taken to prevent its return; and the society has, therefore, appropriated a certain sum of money for purifying the tainted habitations of the poor. Their method consists, simply, in washing the walls of the room with *hot lime*, which will render the place perfectly sweet.

The following rules are to be observed in houses during the prevalence of contagious fevers: they are extracted from an interesting letter lately published by Dr. HAYGARTH, on the prevention of infectious diseases.

1. As safety from danger depends entirely on cleanliness and fresh air, the door of a sick room, where a person labours under an infectious fever (especially in the habitations of the poor), ought never to be shut: a window in it should generally be opened during the day, and frequently during the night.

2. The bed-curtains ought never to be closely drawn round the patient; but only on the side next the light, in order to shade the face.

3. Dirty utensils, clothes, &c. ought to be frequently changed, immediately immersed in cold water, and washed clean when taken out.

4. All discharges from the patient should be instantly removed, and the floor near the bed be rubbed every day with a wet mop or cloth.

5. As some parts of the air in a sick room are more infectious than others, both attendants and visitors should avoid the current of the patient's breath, the exhalation ascending from his body, especially if the bed-curtains be closed, and also the vapour arising from all evacuations.—When medical or other duties require a visitor or nurse to be in such dangerous situations, Dr. HAYGARTH observes, that infection may be frequently prevented by a temporary suspension of breathing.

6. Visitors ought not to enter infectious chambers, *fasting*; and, in doubtful circumstances, on their departure, it will be advisable to blow from the nose, and spit from the mouth, any infectious poison

which may have been inhaled by the breath, and may adhere to those passages.

As these directions are highly important, we trust they will be scrupulously followed, in all cases where any infectious disorders unfortunately prevail.

INFLAMMATION, in medicine, is a tumor attended with unnatural heat, redness, painful tension of the skin, and febrile symptoms, which are more or less violent, according to the nature of the part affected, and the extent of the swelling.

Almost every part of the body is liable to inflammations, but chiefly the bowels, breast, eyes, &c. of which we shall treat in the progress of this article.

The termination of inflammatory tumors depends on their different degrees of violence, and the causes whence they originate, as well as their treatment. Where they appear in consequence of colds, without any previous disposition of the system, they may often be dispersed by the usual applications; but after fevers, and in persons of gross habits, they generally terminate in suppuration. In aged, infirm, or dropsical persons, however, they frequently produce mortification or gangrene.

In treating *external* inflammations, the chief object is to relieve such of the smaller vessels as are obstructed; thus to restore the natural circulation of the blood, and to effect the dispersion of the tumors. Swellings of this nature, if attended with mild symptoms, or arising from external injury, may be safely discussed. Hence various applications may be resorted to, according to the temperament of the patient. For persons of hot, gross habits, cooling external remedies are the most serviceable: by those of an opposite nature, cataplasms of warm emollient herbs may be used with advantage. The effect of these applications will be considerably promoted, by taking at the same time cooling and attenuating medicines while the diet ought to consist of nourishing aliment, that is easily digested; carefully avoiding all salted meat, pickles, spices, fermented or spirituous liquors, and whatever tends to irritate and inflame the body. The most proper food in such cases is broth, barley-water, and decoctions of sorrel, endive, or the like cooling herbs, mixed with small portions of lemon-juice, or other vegetable acids; to which may occasionally be added a little nitre, when the inflammation threatens to increase. But, if the tumor incline to gangrene, it requires a very different treatment, and more peculiarly relates to surgery.—See the article GANGRENE.

INFLAMMATION OF THE BLADDER, or *Cystitis*, an affection of that part of the human frame, accompanied with swelling and pain in the lower region of the belly, frequent and difficult discharge, or total suppression of urine, &c.

Inflammations of the bladder arise from calculous concretions; obstructions in the urethra; Spanish flies, either taken internally, or applied to the skin; from wounds, bruises, &c.

In this dangerous malady, it will be advisable to resort immediately to medical assistance; but, if it cannot be easily procured, the patient may apply leeches round the abdomen. Purgatives should likewise be administered; and clysters prepared from a decoction of poppy-heads, may be injected every second or third hour. It will also be beneficial to apply continually fomentations of the same decoction to the lower belly, and to immerse the patient in the tepid bath.

Should the disease, however, terminate by suppuration, and the matter be discharged with the urine, it will be requisite to use the utmost precaution. The patient's diet ought, during the whole progress of the disorder, to consist of the mildest, though nutritive, aliment. He should also avoid every species of food and drink that is stimulant, saline or acrid; and subsist chiefly on milk, puddings, weak broths, fruits, butter-milk, &c.

Inflammation of the Bowels, or *Enteritis*, an acute, fixed, burning pain in the lower belly, which is attended with a considerable degree of tension in the epigastric region (see Abdomen). The principal symptoms that characterize this fatal malady, are obstinate costiveness; a hard and small pulse; a painful, and almost continual hiccough, together with fever, and a constant inclination to vomit.

Inflammations of the bowels may arise in consequence of swallowing any acrid substance; from violent passion; drinking large draughts of cold water while the body is overheated; from obstructed perspiration; the suppression of any cutaneous eruptions; repulsion of the gout; external injuries; such as wounds, contusions, &c.—Persons of a plethoric habit suffer more acutely from this disorder than those of a contrary temperament.

Cure: If the belly be swelled, firm, and painful to the touch, while the pulse is hard and contracted, it will be advisable to take some blood from the arm, and to immerse the patient in the tepid bath: but, if this cannot be conveniently effected, flannels may be dipped in hot water, wrung out, and applied lukewarm to the belly. A blister should next be employed as speedily as possible, and mild emollient injections of barley water, gruel, &c. administered, till stools be obtained: the patient should be placed between blankets, and supplied moderately with diluent liquids, such as barley water, rice-gruel, &c.—When the violence of the disorder is somewhat abated, opiates may be administered in clysters, which will be of great advantage in mitigating the pain.

As soon as the stomach is able to retain any laxative, the mildest aperients, such as tamarinds with manna, or phosphorated soda, may be taken by the mouth; but, if the disorder tend to a mortification, the treatment before stated should be steadily pursued; and, if gangrene eventually take place, or the disease terminate in suppuration, its course must be left to Nature, the patient being kept as quietly as possible.

During the continuance of this most alarming disorder, the diet ought to be very light; the drinking of all stimulating, fermented, or spirituous liquors carefully avoided; and the mind preserved in a state of tranquillity.

Inflammation of the Female Breast, is generally occasioned by exposure to cold, repression of the milk, or external violence. It is known by the redness, heat, and pain, either of part or the whole of the breast; and, if the disease be considerable, it is usually preceded by a shivering, and accompanied by fever.

Where the inflammation is violent, the usual practice is to take large quantities of blood from the patient; but, in common cases, small local bleedings, by means of a few leeches, are fully sufficient. Considerable benefit will also be derived from the application of emollient poultices, prepared with bread, milk, and cold-drawn linseed oil. The maternal milk may likewise be extracted at intervals, and the breast suspended by means of proper bandages. In some recent cases, a solution of sal ammoniac has been externally applied with success.

If the inflammation continue, it will be requisite to persevere in the use of emollient cataplasms and fomentations: but, as the complaint is of a delicate nature, it will always be advisable to resort to proper medical assistance.

INFLAMMATION OF THE EAR, or *Otitis*, a painful affection of the cavity of the ear, which is sometimes consequent on the MUMPS, but is more frequently occasioned by exposure to cold. In slight cases, this affection may be removed by dropping a little warm oil of almonds into the ear, and by the application of a common poultice of bread and milk, or of a bag of chamomile flowers; either of which ought to be made sufficiently warm. Should the disorder, however, not yield to these remedies, surgical assistance ought to be procured without delay; lest a suppuration take place, and be attended with total loss of the organ of hearing.

INFLAMMATION OF THE EYE, or *Ophthalmia*, an uncommon redness of, and acute pain in the part affected; an inability to bear the light; and involuntary shedding of tears.

This malady is often occasioned by external injuries, such as blows, burns, bruises, and the like. It also arises from splinters, dust, sand, lime, acrid fluids, or other extraneous substances insinuating themselves under the eye-lids; from affections of the teeth; the suppression of evacuations; the precipitate healing of old ulcers; and long exposure to the night air.

Peculiarities: Inflammations of the eye are frequently annual; and instances have occurred, in which they returned at stated periods, and even became chronical: they are farther contagious, and may be caught by mere intuition of the ophthalmia in others.

Method of Cure: When the disease is of a mild nature, it will be useful to put leeches to the temple of the eye affected, in a number proportioned to the age and strength of the patient: after the bleeding has ceased, a blister may be applied, and brisk purgatives given. To obviate the mischief arising from the use of quack medicines, such as lotions, &c. we shall briefly observe, that there is no better collyrium than simple rose-water. Beside these remedies, much benefit has been received from shaving the head, or cutting the hair; from bathing the feet and legs frequently in warm water; and, where the inflammation succeeds the small-pox, from applying infusions of marsh-mallows with sal ammoniac to the inflamed parts. In cases of periodical ophthalmia, emetics have been of eminent service, and in some instances completely removed the complaint; but, if it have arisen from particles of iron accidentally dropped into the eye, they may be easily extracted by means of the magnet, and thus the disease checked in its progress.—**Thunberg** advises the vapour of cajeput oil to be frequently applied; and Mr. **Ware**, in his practical "*Remarks on the Ophthalmy*, &c." recommends a few drops of laudanum to be introduced into the eye;—such a powerful remedy, however, should be administered only by the expert practitioner.

If the means before stated prove ineffectual, and the pain in the inflamed parts rather increase than abate, professional assistance must be speedily procured. Meanwhile, the eye should be carefully secluded from the influence of light, or the patient may confine himself to a dark room, having a temperature neither too cold nor too warm, and cautiously avoid a draught of air. His diet cannot be too mild.—Lastly, in this, as well as every other species of inflammation, it is of the utmost importance to abstain from all heating or stimulating aliment and liquors, from all violent efforts both of body and of mind; and to encourage an inclination to sleep.

Inflammatory Fever, a sudden and acute febrile disease, chiefly prevalent in hot climates. It commences its attack with a considerable degree of shivering, and severe pain in the small part of the back, which are succeeded by an intense heat of the whole body. The eyes are red, and incapable of supporting the light; the patient suffers an insatiable thirst.

The cure of this fever is generally effected by repeated bleedings, proportioned to the patient's strength, and the violence of the disease: antimonial and aperient medicines; the liberal use of vegetable acids; neutral salts; and sudorifics, are given in the various stages, according to the urgency of symptoms. As, however, this fever is attended with great danger, it will always be more prudent and advisable, on its first appearance, to call in medical assistance.

Regimen and Diet: The room of the patient should be kept cool, by a constant succession of fresh air, and somewhat darkened; while every precaution is taken to ensure a state of tranquillity. All animal food, and even broths, must be carefully avoided, as well as aromatic, fermented, and spirituous liquors. The insatiable thirst during the paroxysms of this fever, may be quenched by the free use of barley-water, balm-tea, or other mild vegetable infusions, acidulated with the juice of oranges, lemons, currants, and other sub-acid fruits.

Beside the different inflammatory diseases, of which we have briefly treated in the preceding sections, there are various other species of inflammation, denominated from the particular organs or parts affected. Thus, the reader will find some useful hints under the article **Brain**, vol. i. p. 324; and, with respect to the subsequent letters of the alphabet, we refer him to the heads of **Kidnies**, **Liver**, **Lungs**, **Mesentery**, **Pleurisy**, **Quinsy**, **Rheumatism**, **Spleen**, **Stomach**, **Tonsils**, &c.

INGROSSING, is the act of accumulating or buying up corn or other provisions, by wholesale, with a view to sell the same articles at a higher price, and thus to oppress as well the poor, as those who cannot conveniently purchase a large stock. This atrocious practice has at all times been subject to severe penalties; and, having already treated of them, under the head of **Forestalling**, we refer the reader to that article.

INK, a black fluid employed in writing, and usually prepared with an infusion of galls, copperas, and gum-arabic.

The chief requisites for the making of good ink, are, 1. Limpidity, so that it may flow freely from the pen. 2. A deep, uniform and black colour. 3. Durability, so that the letters be not liable to be effaced by age; and 4. It should be divested of any corrosive quality, by which the substance of the paper may be destroyed, or the writing rendered in any degree illegible. No ink, however, hitherto used, possesses all these properties; hence several ingenious chemists have been induced to make experiments, in order to render it more perfect.

M. Ribaucourt, in the "*Annales de Chimie,*" directs eight ounces of Aleppo galls, and four ounces of logwood, to be boiled in twelve pounds of water, till the quantity is reduced to one half; when the liquor should be strained through a linen or hair sieve into a proper vessel. Four ounces of sulphate of iron (green vitriol); three ounces of gum-arabic; one ounce of sulphate of copper (blue vitriol); and a similar quantity of sugar-candy, are now to be added: the liquid should be frequently shaken, to facilitate the solution of the salts. As soon as these ingredients are perfectly dissolved, the composition is suffered to subside for twenty-four hours; when the ink may be decanted from the gross sediment, and preserved for use in glass or stone bottles, well stopped.

This ink exhibits a purplish-black colour in the bottles; but the writing performed with it, is said to be of a beautiful black cast, which it retains, unaltered, for a considerable length of time. Each quart of the preparation contains:

	oz.	*drs.*	*grs.*
Of galls - -	2	5	20
Green vitriol	1	2	40
Logwood -	1	2	40
Gum - -	1	0	0
Blue vitriol -	0	2	40
Sugar-candy	0	2	40

M. Ribaucourt is of opinion, that ink thus prepared, may be preserved several years in a state of perfection, without depositing either galls or iron.

The ink commonly used, is manufactured by stationers, according to Dr. Lewis's recipe; but it is ill calculated for keeping, as it deposits a black sediment, while the fluid itself is of a pale colour. Each quart of this ink contains:

	oz.	*drs.*	*grs.*
Of galls - -	3	0	0
Green vitriol	1	0	0
Logwood -	0	5	24
Gum - -	1	0	0

Neither blue vitriol nor sugar are employed in this preparation. As, however, both the ink made after the latter method, and that compounded according to other recipes, are not adapted to resist the effects of acids, and are consequently by no means fit for records, deeds, and other documents, M. Westrumb recommends the following ingredients, as being well calculated to remedy this inconvenience. He directs one ounce of Brazil-wood, and a similar quantity of gall-nuts, to be boiled in forty-six ounces (somewhat less than three pints) of water, till the whole be reduced to thirty-two ounces, or about two quarts. This decoction is to be poured, while hot, upon half an ounce of copperas, or green vitriol; a quarter of an ounce of gum-arabic, and a similar quantity of white sugar. As soon as a perfect solution of these substances has taken place, one ounce and a quarter of indigo finely pulverized is to be added; together with three quarters of an ounce of the purest lamp-black, previously diluted in one ounce of the best brandy. The whole is to be well incorporated; and, after it has subsided, M. Westrumb asserts that it will form an ink *absolutely indestructible by acids.*

A more simple composition, is that proposed by M. Bosse, who directs one ounce of Brazil-wood to be boiled in twelve ounces of water with half an ounce of alum, till the liquid be reduced to eight ounces; when one ounce of calcined manganese is to be mixed with half an ounce of gum-arabic, and added to the liquor, which should be previously decanted, in order to render it perfectly limpid. This preparation is said to possess the property of being indelible by the use of any kind of acid, and to be superior to that proposed by M. Westrumb.

A durable ink may also be prepared by washing paper, parchment, &c. with the Prussic acid, which will not in the least injure either of these substances. The materials, thus prepared, may be written on with common ink, and a ground of Prussian blue will be formed beneath every stroke, which will remain long after the black has decayed by the influence of the air, or been destroyed by acids.

The latest, and perhaps most simple, preparation of *black ink,* is that contrived by Van Mons, who observed that sulphate of iron, or green vitriol, when calcined till it became *white,* uniformly afforded a very beautiful black precipitate. According to his experiments, the following ingredients produced an excellent writing ink: four ounces of galls, two ounces and a half of calcined vitriol of iron perfectly white, and two pints of water. The whole was infused in a cold place for twenty-four hours; adding ten drams of pulverized gum-arabic, and preserving it in a glass bottle, or glazed earthen vessel, slightly covered with paper.

Indian Ink, a valuable black for water-colours, imported from China, and other parts of the East Indies, generally in oblong square cakes, impressed with Chinese characters. The preparation of Indian ink was discovered by Dr. Lewis, according to whom it consists of lamp-black and animal glue. In order to imitate it, he directs as much lamp-black to be mixed with the glue, as will be sufficient to give it a proper tenacity for making it into cakes. This composition is said fully to answer the different purposes to which the genuine Indian ink is subservient, both with regard to the colour, and the facility with which it may be applied. Dr. Lewis farther found that ivory-black, and other blacks obtained from charcoal finely levigated, may be advantageously substituted for lamp-black: ivory and charcoal, however, are generally sold in so gross a state, as to prove gritty when worked, and to separate too speedily from the water.

Ink-powder is prepared chiefly from the acid salt of galls, which may be obtained by the following process: Take two ounces of pulverized galls, and infuse them in twelve ounces of rain or river-water; expose the whole for a few days to a warm temperature, and stir it occasionally: after having extracted the colouring matter, filtre the solution, and suffer it to stand in the open air for several weeks, in a vessel slightly covered. A sediment will then be gradually formed; which, after removing the mouldy skin from the top of the liquor, should be carefully collected. Hot water is next poured on this sediment, when it is again filtred and evaporated to dryness: thus, a grey crystalline salt will be produced, that is the essential basis of black ink; and which may be still more purified by repeated solution, filtration, and evaporation.

If one dram of this salt of galls be triturated with an equal quantity of the purest vitriol of iron, and about twenty grains of perfectly dry gum-arabic, a composition will be obtained, which, on adding a proportionate quantity of warm water, instantly affords an excellent black ink.

Blue Ink. One ounce of the finest indigo is first levigated in a glass mortar; then four ounces of the most concentrated vitriolic acid are very gradually poured on the powder; and, on every addition, it is stirred with a glass pestle, so that the whole mixture will require several hours. Such precaution is indispensable, as otherwise the heat generated on adding the vitriolic acid, would impair the brightness of the colour.

After standing from 12 to 18 hours, in a moderately warm place, this dense mixture must be diluted with water; not by adding this fluid to the composition, but by introducing small portions of the latter into a vessel containing such a quantity of water as may be requisite to produce a lighter or darker shade. In general, from 30 to 40 parts of water will be necessary to reduce it to a fine blue liquid.

This diluted solution of indigo is, however, in too caustic a state to be employed either as a blue dye, or as writing ink. Hence the vitriolic acid ought to be divested of its corrosive quality, by means of such a substance as may form a chemical combination with the acid, and not precipitate the indigo. If the solution be intended merely for colouring or writing on paper, it will be sufficient to add pulverized chalk in small portions, till it cease to effervesce; because a large quantity of this powder, at a time, would cause the liquid to rise above the brim of the vessel. It is easy to ascertain the point of saturation; for, when the powder of chalk scattered on the surface no longer produces any bubbles, the solution should be suffered to stand for 24 hours, then filtred through blotting paper, and preserved in bottles.—If, however, this preparation be designed for dyeing silk, such as stockings, &c. it will be preferable to neutralize the vitriolic acid by the addition of aluminous earth, instead of chalk, as the former renders the colour more durable. And, if the solution is to be used for painting on silk, it ought to be previously mixed with gum tragacanth.

Green Ink. Take a glass retort containing about one quart; pour into it one pint of distilled vinegar; place it over a sand heat, and when it begins to boil, introduce into the liquid small portions of powdered verdigrease, till a saturated solution is obtained, or till no more colouring matter can be dissolved. In order to keep the latter suspended, and prevent the formation of crystals, it will be requisite to add about the sixth part of gum-arabic, in proportion to the verdigrease.

For preparing *red* and *yellow ink*, see the articles Red and Yellow.

Printing, or Printers' Ink, differs greatly from every other species. It is an oily matter of the consistence of an ointment, the composition of which is, at present, very imperfectly known, excepting to the few who are employed in its manufacture. The following recipe, however, has been found to make printing ink of a tolerable good quality: Let two quarts of linseed-oil be boiled in a vessel capable of holding a triple quantity, over a strong fire, till it emit a thick smoke. It is then to be kindled with a piece of paper, and suffered to burn for the space of a minute, when the flames must be extinguished, by closing the vessel. As soon as the oil becomes cool, two pounds of black resin, and one pound of hard soap, cut into thin slices, are to be added; the mixture again placed over the fire; and, when the ingredients are perfectly dissolved, a pound of lamp black, previously sifted, must be incorporated with the mixture; after which the whole is to be finely ground on a marble stone.

This method of making printers' ink is acknowledged to be preferable to the different recipes hitherto published. It is, however, much inferior in beauty of colour to the ink generally used, and is apt to adhere to the types, so as to make an indistinct impression. Good printers' ink, which is easily worked, without daubing or tearing the paper, while it imparts a fine colour, is a desideratum that will amply repay the attention and time bestowed upon its preparation.—See Printing.

Sympathetic Ink, a liquor employed for writing on paper, so that it may retain its natural whiteness after the letters are formed, till it is held near the fire, rubbed with another liquor, or some other expedient is used to render the characters legible.

Sympathetic inks are prepared from various substances, such as bismuth, lead, &c. Thus, a solution of common sugar of lead in water, if employed with a clean pen, will remain concealed till it is wetted with a solution of the liver of sulphur, or is exposed to the vapours of such liquid; in which case it will assume a deeper or lighter brown shade, in proportion to the strength of the sulphureous gas. By the same process, words written with a solution of bismuth in spirit of nitre, will appear of a deep black colour.

Another sympathetic ink may be easily prepared, by diluting oil of vitriol with a sufficient quantity of water, to prevent the paper from being corroded. Letters drawn with this fluid are invisible when dry, but, on being held near the fire, they assume a perfectly black colour. The juices of lemons, or onions; a solution of sal ammoniac, &c. will answer a similar purpose, though their application is more difficult, and they afterwards require a greater degree of heat.

On the subject of removing or discharging *spots*, occasioned by different inks on linen, silk, or woollen cloth, we shall treat under the article Spots.

INN, a place appointed for the reception and entertainment of travellers.

The inns of this country are under admirable regulations, which, if properly enforced, would prevent many iniquitous practices carried on by inn-keepers. These persons are licensed by justices of the peace, and are obliged to enter into recognizances for the maintenance of good order. Thus, if an inn-keeper refuse to receive a traveller into his house as a guest, or to furnish him with necessaries, on his offering a reasonable price, the former is liable to an action for damages, and may be indicted at the King's suit.

In case any inn-holder refuse to sell his hay, oats, &c. he is liable to fine and imprisonment, by the 21 Jac. I. c. 21. And if any guest lose property in such a house, an action may be brought against the keeper of the inn for its recovery, or the adequate value.

There are various other regulations, which are equally advantageous to the landlord, who is justified in seizing the horse, or other article belonging to his guest, for the reckoning, till the debt is paid. And if a person leave his horse in the stable of an inn, the keeper may detain it till the owner pay the expence occasioned by feeding it: should the animal, however, consume as much provender as is eqaal to his value, upon a fair appraisement, the landlord is empowered to sell it, and reimburse himself.

INOCULATION, or *budding*, in horticulture, an operation performed on apricots, nectarines, plums, cherries, or other stone-fruit trees, and also upon oranges and jasmines. It is reputed to be superior to every other species of grafting, and is effected in the following manner:

A sharp knife, with a flat handle, must be first procured, in order to raise the bark of the stock for the insertion of the bud. Next, some strong *bass* should be soaked in water, in order to increase its strength, and to render it more pliable. The cuttings being then separated from the trees that are to be propagated, a smooth part of the stock must be selected, about five or six inches above the surface of the soil, if intended for dwarfs; but if designed for standards, they should be budded at least five feet above the ground.

An horizontal incision is now to be made across the bark of the stock, from the middle of which a perpendicular slit should be drawn, about two inches in length. The leaf is next cut off the bud, the foot-stalk remaining entire; and a cross cut is made about an inch beneath the eye, after which the bud is to be cut off, with part of the wood adhering to it. The bark of the stock is then to be gently raised with the handle of the knife, and the bud inserted exactly between the rind and the wood of the stock; after which they are bound closely with the *bass*, care being taken to leave the eye of the bud open.

In the course of three weeks, or a month after the inoculation is performed, those buds which have a fresh and flourishing appearance will be joined, when the bandage ought to be removed. In the succeeding month of March, the stock must be cut off in a sloping direction, about three inches above the bud: the shoot proceeding from it should now be fastened to the remainder of the stock for one year, after which the latter ought to be removed by the knife, immediately above the bud.

The proper season for this operation, is from the middle of June to that of August. The fruit-tree first inoculated, is generally the apricot, and at length the orange-tree, which, however, ought not to be budded till the end of August. For this purpose, cloudy and moist weather is the most propitious; for, if the inoculation be attempted in the middle of the day, the shoots will perspire so rapidly as to leave the buds destitute of moisture.

INOCULATION, in *medicine*, is the transferring of distempers from one subject to another, particularly of the small, and cow-pox.

The practice of inoculation is of great antiquity in the East, whence it was introduced into Britain, early in the 18th century; though not without many struggles, and violent opposition, under the frivolous pretext, that it was contrary to the principles of Christianity, and usurping the sacred prerogatives of the Creator. On account of its superior utility, however, it has at length triumphed, and is now almost generally adopted, excepting among a few fanatics, who, from superstitious motives, confirmed by obstinacy and ignorance, still object to it as an unlawful, and even sacrilegious attempt. The curious reader, who is desirous to become acquainted with these objections, will find them stated, together with a defence of inoculation, in Dr. Lettsom's *Medical Memoirs*.

Various methods have been adopted, for the artificial communication of the small-pox; the most effectual of which appears to be that of making a puncture in the skin, or removing the epidermis of the upper arm with the point of a lancet, dipped in variolous matter.—For the proper treatment of persons during the progress of inoculation, the reader will consult the article Small-Pox, where the comparative advantages of its recent substitute, the *cow-pox*, will be concisely stated.

INSECTS, in natural history, form the most diminutive class of animals, which are distinguished by certain incisures or indentations found in their bodies.—See also Animal Kingdom; vol. i. p. 58.

Having already stated, under the articles Apple-tree, Cabbage, Corn, Caterpillar, Fruit-trees, Hot-house, &c. the most efficacious methods of destroying different kinds of insects, we shall at present communicate such expedients as have not yet been specified, but which deserve to be more generally known.

Blite-insects, *(aphides*, or plant-lice), may be destroyed by the smoke of tobacco, or by scattering on them Scotch snuff. Another method is, to place a few of the larvae of the beetles, called Lady-birds, or Lady-cows *(Coccinellæ septem-punctatæ)* on the plants infested with the *blites*, which, it is asserted, will be thus in a short time destroyed.—Dr. Darwin, however, is of opinion, that the most ingenious, as well as the most effectual method of preventing the depredations of these insects, consists in artificially propagating the larvae of the aphidivorous fly, of which we have given the annexed representation;

and which has been observed by naturalists to deposit its eggs where the aphis abounds.

As soon as the larvae are produced, they devour the aphides around them, seizing the latter in their mouth, as delineated in the cut, and extracting their juices. We have not been able to ascertain their exact duration in a caterpillar state, but believe that in about a fortnight they contract, and attach themselves to some solid matter, by means of a little gluten which is discharged from their mouth; and are thus converted into *chrysales* or *nymphæ*, as above represented. In this state, the insect continues 10 or 11 days, when it bursts its cell, and emerges a perfect fly, of which likewise a delineation is given.

If these insects could be collected, carefully preserved during the winter season, and properly disposed on nectarine and peach-trees, early in the spring, Dr. DARWIN thinks, it is probable that the depredations of the blite might be counteracted, "by the natural means of devouring one insect by another; as the serpent of Moses devoured those of the magicians."

A kind of bellows has been invented by Mr. GREEN, of her Majesty's flower-garden, Kew, for the purpose of destroying the red spider, and other noxious insects in hot-houses and pineries, with the fumes of burning tobacco. The same noxious vermin may likewise be exterminated by burning (when the hot-house is shut), matches moistened with a spirituous tincture of asa-fœtida, and rolled in a powder consisting of equal parts of sulphur and Scotch snuff. It will also be of service to wash the frames of hot-houses, &c. with four ounces of sublimate, dissolved in two gallons of water; but this operation should be performed with the utmost caution, on account of the corrosive properties of the mercury.

In the *Annales de Chimie*, M. TATIN gives an account of a compound which he has successfully used for exterminating insects. He directs 1¾ of a lb. of the best black soap; a similar quantity of flowers of sulphur; 2lbs. of any kind of mushrooms; and 15 gallons of rain or river water, to be employed. The fluid is to be divided into two equal parts, one of which is put into a barrel, together with the soap and mushrooms, after the latter have been somewhat bruised. The other half is to be boiled in a kettle with the sulphur inclosed in a bag, and fixed to the bottom of the vessel, by means of a stone or other weight.

These ingredients are to be boiled 20 minutes, during which the sulphur should be well agitated with a stick, that the water may be the better impregnated. When the liquid is taken from the fire, it is to be poured into the barrel, and stirred daily, till the mixture become in a high degree fetid: for, the older and stronger the composition is, the more speedy and powerful will be its effects. The liquor is to be sprinkled on the plants infested with insects: great numbers of which it destroys on the first application; it will, however, be necessary to repeat the aspersion, in order to exterminate ants, or other vermin that breed beneath the soil: and, for this purpose, from two to eight

eight pints are required, according to the depth and extent of their nests.

Although insects are very injurious to vegetation, yet Dr. DARWIN is of opinion that they may be rendered extensively useful as a *manure*. Hence, in the summer months, he recommends heaps of dung to be supplied with water, for promoting the propagation, and nourishment of myriads of vermin; which, when suffered to decay on the soil, would greatly contribute to its fertility.

The catching and preservation of insects, for the collections of naturalists, is indeed a necessary practice, though it has at all times been branded with cruelty. Hence, in stating the most proper methods of effecting this purpose, we shall likewise point out the easiest expedients to deprive them of life.

Beetles, and other insects of the same class, may be caught either with a gauze net, or with a pair of pincers covered with gauze. As soon as they are secured, it will be advisable to immerse them either in hot water, or in spirits of wine, where they will be instantaneously killed: next, they may be fixed to a piece of cork, in a creeping direction, and exposed to the air till all their moisture be evaporated.

Bugs, crickets, and other insects of the hemipterous class, may be put to death in the manner just mentioned, or by pouring a drop of etherial oil of turpentine on their head.

Moths, butterflies, and all other flies which are furnished with membranous wings, may be taken with gauze nets; then pierced through the shoulders between the fore-wings, with a pin; and, after gently squeezing the breast of the insect, it will immediately perish.

Lobsters, scorpions, or such vermin as have no wings, may be preserved in spirits; and the various other kinds of insects may either be killed with oil of turpentine, or the fumes of sulphur.

After the insects are deprived of all moisture, they should be placed in the boxes or cabinets where they are to remain; these should be kept very dry, and closely shut, to prevent the depredations of small vermin. The bottoms ought likewise to be covered with pitch, and paper on the surface; or, they may be preferably lined with cork, which should previously be impregnated with corrosive sublimate, in a strong solution of sal ammoniac.

INSTINCT, denotes that faculty or disposition of mind, by which animals are led spontaneously to perform whatever is necessary to preserve the individual, or to continue the species; independently of any instruction or experience, and aiming at no determinate object.

Thus, infants suck immediately after they are born; thus, too, insects deposit their eggs in all climates, invariably in such situations as are peculiarly favourable for the hatching and support of their future progeny.

In succeeding years, the faculties of the juvenile mind enlarge, and our conduct is, or at least ought to be, dictated by *reason*; while the actions of the brute creation are generally directed by *instinct*. With respect, however, to the *human* instinct, philosophers are by no means agreed; some affirming that man possesses a greater number of instincts than any species of brutes, while others assert that human nature

ture is utterly destitute of any power or propensity, that can with propriety be denominated *instinctive*. Amid such diversity of opinions, it is difficult to decide; though it cannot be denied that infants afford very strong proofs of a natural impulse. But the inquisitive reader, who is in search of farther information, may with satisfaction peruse the late Mr. SMELLIE's *Philosophy of Natural History*, 8vo. and Dr. REID's *Essays on the Active Powers of Man*; in which the subject is considered in different points of view.

INSURANCE, in law and commerce, denotes a contract by which one party engages to pay the other, for a certain premium or consideration, such losses as he may accidentally sustain. The common kinds of insurance are:

I. *Against loss at sea*; a most beneficial institution, eminently calculated for promoting the security of trade. It is at present conducted by a regular system of rules, under the immediate sanction of the law, the decisions of courts of justice, and the usage of merchants. There are several societies for this kind of insurance in London; but, as it would be incompatible with our limits to enter into any details, we shall point out Mr. PARK's masterly *System of the Law of Insurances* (8vo. Butterworth, 12s. 1801); in which the subject is fully considered. A smaller work of reference, designed for the use of merchants, and relating to *Insurance against Losses at Sea*, has lately been published by Mr. BURN.

II. *Against fire*; for which purposes various offices are established in Britain: the principal of them is, probably, the *Sun Fire-office*. This class is divided into three species, namely:

1. *Common insurances*: buildings, the whole external walls of which are of brick or stone, with coverings of slate, tiles, or metals, and in which no hazardous trades are carried on, or hazardous goods are deposited. In this division are also comprised goods which are not hazardous, and which may be kept in such buildings.

2. *Hazardous insurances*, which include buildings covered with slate, tile, or metal, whether built of timber, plaister, timber and plaister, brick and timber; and also buildings, the external walls of which are *not* wholly of brick or stone, and in which no hazardous trades are carried on, or hazardous goods are deposited: and brick or stone buildings with the coverings above-mentioned, containing hazardous trades or wares.—Also goods, deposited in all timber, plaister, timber and plaister; and brick and timber buildings; hemp, flax, pitch, tar, cotton, turpentine, resin, oil, spirits, and the like, are classed among hazardous insurances, as likewise are the trades or manufactories using the last-mentioned articles.

3. *Doubly hazardous insurances*: namely, all the buildings mentioned in the preceding section, however covered, if they be occupied by hazardous trades or goods; and all thatched buildings.

Ships, vessels, barges, and other craft, together with their cargoes; glass, china, earthen-ware, pottery, bottles, bottled liquors in trade, ornaments, shells, fossils, ores, medals, curiosities, oil of vitriol, cork, statuary, and figures in wax, plaister, and marble; are all included in this subdivision, to which may be added the trades of boat-builders, cart-grease-makers, cork-cutters, varnish, flambeau, and lamp-black-makers, hartshorn and vitriol works, oil, silk, and linen manufacturers, and japanners.

Such are the species into which insurances against fire are divided: and that our readers may form some estimate of the expence of insuring goods, &c. against loss or damage by fire, we have subjoined the following brief table, in which the different *annual rates*, payable at the British Fire-office in the Strand, may be seen at one view.—Beside these rates, however, there is a duty of three shillings to be paid to government, for every policy of insurance where the sum insured does not amount to 1000l.; and of six shillings, if it amount to 1000l. or upwards.

		Common.		Hazardous.		Doub. Hazard.		
	£.	*s.*	*d.*	*s.*	*d.*	*s.*	*d.*	
Any sum not exceeding	1000	2	0	3	0	5	0	per Cent.
	2000	2	6	4	0	6	0	
	3000	2	6	5	0	7	0	
	5000	3	0	5	0			

When the sum insured is large, a higher premium per cent. is demanded; and money, papers, pictures, gunpowder, and jewels, are excluded.—If an article be falsely described, in order that it may be insured at a lower premium, the policy is justly void. An insurance made on the same subject at different offices, must be specified by indorsement on the policy; and, in case of loss, the offices pay a sum in proportion; as well as all the expences incurred in attempting to extinguish fire, or to save goods, even though the endeavours should not be attended with success. And if the value of an article be partially insured, and receive damage by fire, the society is bound to make restitution only to the extent of the sum for which the premium is paid.

III. *For lives*: by virtue of which, on the demise of the party insured, a sum of money becomes due to the person for whose benefit the insurance was made. In this respect also, several societies grant policies of insurance for certain premiums: and, though our limits do not allow us minutely to specify the rules and rates of computation which different associations have adopted, yet we think it will be useful to exhibit a few particulars relative to the premiums paid by persons, who insure either their own lives, or those of others in which they have a certain interest. In the following table we have stated the *rates of insurance on lives*, fixed by the Westminster Society (No. 429, Strand), which was established in 1792: it is calculated to shew the premiums for insuring *one hundred pounds*, upon the life of a healthy person, from the age of eight to sixty-seven years, within the limits of Europe, but not upon the seas, viz.

Age.	Premium per cent. for one year.	Premium per cent. per annum, for an insurance for seven years.	Premium per cent. per annum, for the whole continuance of life.
	£. s. d.	£. s. d.	£. s. d.
8 to 14	0 17 9	1 1 5	1 17 7
20	1 7 3	1 9 5	2 3 7
25	1 10 7	1 12 1	2 8 1
30	1 13 3	1 14 11	2 13 4
35	1 16 4	1 18 10	2 19 10
40	2 0 8	2 4 1	3 7 11
45	2 6 8	2 10 10	3 17 11
50	2 15 1	3 0 8	4 10 10
55	3 5 0	3 12 0	5 6 4
60	3 18 1	4 7 1	6 7 4
65	4 15 2	5 10 10	7 16 9
66	5 0 1	5 17 7	8 4 1
67	5 5 6	6 5 2	8 12 1

	£. s. d.
Thus, a life not exceeding the age of 30 years, may be insured for 100l. to be paid in case of death within one year, for - - - - - - - -	1 13 3
Within seven years, by paying annually till the insured shall die, or the seven years be elapsed, - -	1 14 11
Whenever the death shall happen, by paying annually till that event - - - - - - -	2 13 4

Another method of insuring for the benefit of survivors, consists in paying an annual premium for a certain sum recoverable *on the death of one person named out of two*; but, as this mode of securing a *competency* is doubtless more objectionable to the party that is obliged to pay the annual premium, than either the preceding *simple*, or subsequent *double* chance of obtaining an equitable reimbursement, we have been induced to subjoin the following table, which exhibits the premium of insurance of one hundred pounds, payable when *either of two persons* shall die within the limits of Europe, but not upon the seas.

Age.	£. s. d.		Age.	£. s. d.
10	2 17 1		40	5 11 9
15	3 5 0		45	6 7 4
20	3 13 11		50	7 7 8
25	4 0 10		55	8 12 2
30	4 8 11		60	10 4 9
35	4 19 0		67	13 15 8

We have purposely omitted, in this table, the intermediate as well as the unequal ages of the parties whose lives are *jointly* insured;

because the reader will be enabled to form a sufficient idea of the different rates, by comparing the present abstract with that of the preceding calculation. — Lastly, the same duties are imposed by government for insurance on lives, as those we have mentioned against losses by fire.

INTEREST, implies the premium or sum, paid for the loan or use of money.

The rate of legal interest has varied, and been progressively reduced, during the last two centuries; accordingly as the quantity of specie has increased by accessions of trade, the introduction of paper-credit, and other circumstances. The stat. 37 Hen. VIII. c. 9, confined interest to ten per cent.; and likewise the stat. 13 Eliz. c. 8. But as, through the encouragement given in her reign to commerce, the nation became more wealthy, the stat. 21 Jac. I. c. 17, lowered it to eight per cent.; the 12 Car. II. c. 13, to six; and lastly, by the stat. 12 Ann, c. 16, § 2, it was reduced to five per cent. yearly, which is at present the highest legal interest that can be taken.

It is also enacted by the same law, that if any person take, upon whatever contract, either *directly* or *indirectly*, more than five per cent. *per annum*, for the loan of money, goods, &c. he shall forfeit treble the value of the money, &c. thus advanced; one half of which belongs to the crown, and the other to the informer.

If a contract, which carries interest, be made in a foreign country, the courts of justice in Britain will direct its payment, according to the law of that country in which the contract was made. And by stat. 14 Geo, III. c. 79, all mortgages and other securities upon estates, or other properties, in Ireland, or the Plantations, bearing interest not exceeding six per cent. shall be legal, though executed in the kingdom of Great-Britain; unless the money lent shall be known at the time to exceed the value of the thing in pledge; in which case also, to prevent usurious contracts at home, under colour of foreign securities, the borrower shall forfeit treble the sum so borrowed.

INTERFERING, a local disease incident to horses. It arises from various causes; and though this malady is sometimes constitutional in the animal, yet it is more frequently occasioned by an improper method of shoeing; in consequence of which the horse moves his hind feet so closely together, that hard scabs are gradually formed by their continual friction, and the disorder at length is attended with halting or lameness.

According to Professor Bradley, *interfering* may be cured by a compound made of three parts of fresh sheep's dung, and one part of rye or wheaten flour, well dried.—These ingredients should be formed into a cake, then baked in an oven, and applied warm to the part affected, which will thus speedily heal; or, it may be anointed with a mixture of turpentine, and verdigrease finely pulverized, by the use of which the scabs in general shortly disappear.

Interment. See Burial; and Apparent Death, vol. ii. p. 125.

Intermittent Fever. See Ague.

INTESTINES, in anatomy, are those hollow membranous tubes of the human body, commonly termed the *guts* or *bowels*, which extend from the right orifice of the stomach to the anus. They are six times longer than the whole body, and by Nature destined to receive the *chyme*, or the aliment, so called after it is converted into a kind of pulp, which they retain for a time; then to mix it with the intestinal juice and bile, to separate and propel the chyle into the milk-vessels, and to eliminate the excrements.

The intestines are extremely irritable. If one of the bowels be slightly cut, the edges of the wound retract equally; and if it be penetrated or cut through, they curl themselves back so as to envelope the upper parts; and the inside is thus completely turned outwards. For an account of the constituent parts and denominations of the intestines, the reader will consult the article ABDOMEN.—See also INFLAMMATION of the BOWELS.

INTOXICATION is a term expressing that depravity of human nature, which requires no farther explanation, as it is but too often practised both by the vulgar, and those whose *professions* lead us to expect a very different conduct.

Having already exposed the moral turpitude of DRUNKENNESS, under that article, we shall now point out a few of the consequences that necessarily result from the brutal indulgence in that odious vice.

The state of intoxication greatly resembles that of an incipient palsy or apoplexy. Inebriated persons stagger in all directions; they stammer; every thing appears double; their tongue is in a manner paralytic, and they are deprived of the faculty of speech. This imbecility extends to the mind, which is thus rendered totally incapable of reflection. As the brain is overcharged with blood, the vessels pressing on that part are very liable to burst, from the least accidental concussion; and the unfortunate victim of such folly may expire, while he remains insensible of his danger. Hence he ought to be conveyed into a cool rather than warm room, and placed between blankets, with his head considerably raised; but the legs should be in a pendent situation, and the feet bathed in lukewarm water. Every tight ligature of the shirt, waistband, garter, &c. must be immediately relaxed, and diluent drinks, such as barley or rice-water, plentifully given, though in small portions. Next, a gentle emetic is to be introduced, and the throat stimulated with a feather dipped in oil: after vomiting, the patient generally falls into a profound sleep, from which he awakes weak, trembling, and affected with a violent heart-burn, and acidity of the stomach; especially if wine has been the favourite liquor. To remove the latter complaint, calcined magnesia may be taken with advantage, and afterwards moderate draughts of negus, or coffee. Plethoric individuals, however, will better consult their health, by drinking cold water only, which is one of the most salutary restoratives: and during the fit of intoxication, it will sometimes be necessary to open a vein; an expedient which may rescue such persons from the brink of destruction. But, if they have been inebriated by ardent liquors, so that a vapour or smoke proceeds from their mouths, equal quantities of milk and barley-water ought to be instantly poured in; or, where these liquids could not be easily procured, the fresh urine of a healthy subject has been found to afford an excellent substitute. Nor can there be any reasonable objection against this remedy, in cases of a desperate and degrading nature.

Instead of expatiating on the long train of miseries and painful disorders with which habitual intoxication is sooner or later attended, and of which we treat in the alphabetical order of human maladies, we shall conclude in the words of the philosophic SHAKESPEARE, who very pertinently remarks, that "Drink provokes or stimulates the desire, but it takes away the performance."

JOHN's-WORT, or SAINT JOHN's-WORT, *Hypericum*, L. a genus of plants comprising sixty-three species, nine of which are natives of Britain. Of these, the principal is the *perforatum*, Common, or Perforated Saint John's-wort, growing to the height of eighteen inches, in thickets, woods, hedges and on dry banks: it flowers in the months of July and August.

This plant is eaten by goats, cows, and sheep, but is refused by horses and hogs. Its medicinal virtues are not accurately determined. The leaves, however, when given in substance, are said to destroy worms; and the semi-pellucid dots found on them, yield, on distillation, an essential oil. In Sweden, the flowers are used to impart a purple tinge to spirits; and the whole plant, when dried, and boiled in alum-water, communicates yellow or brown-red shades to yarn. The seed-bearing tops contain a fine red colour, that appears on friction between the fingers, and more than any other vegetable, resembles the *gum-lac*.

JOINT, generally speaking, signifies the juncture of two or more things: it is also applied to the human frame, in which case the joints are anatomically called *articulations*.

The joints, like other parts of the body, are subject to a variety of disorders, such as sprains, rheumatism, &c. of which we treat in their respective order. We shall, therefore, briefly mention a patent granted in 1796, to Mr. FRANCIS LOWNDES, for a new invented machine, called *Gymnasticon*, which is peculiarly calculated for exercising the joints and muscles. The whole frame may be constructed of wood only, or conjointly with metals, of any shape or dimensions, so arranged, by means of cranks, fly-wheels, and treading-boards, as to give motion, both voluntary and involuntary, to the joints, limbs, and muscles of the human body. As, however, this patent is unexpired, and cannot be satisfactorily explained, without the aid of an engraving, we refer the inquisitive reader to the 6th vol. of the *Repertory of Arts and Manufactures*, where it is fully specified.

JOURNAL, or DIARY, properly signifies a day-book, register, or account of particular circumstances occurring daily, and deserving to be noted.

Journals are of extensive utility, in an economical point of view; and we are convinced, that all persons engaged in any active pursuits, especially those of rural and domestic economy, would avoid many inconveniencies, by keeping regular accounts. This object, we conceive, might be easily attained, by arranging the pages, ruled with columns, and pointing out the names of workmen, together with the several days of the week, in which the duration and nature of the work done, and the industry or idleness of labourers, might at once be exhibited, by means of simple characters. To these may be added *four* columns; one specifying the rate or price of the labour per day, another containing the number of days, and length of time individuals have respectively worked; a third, for the sum total due to them; and the last for the insertion of occasional remarks.

This plan is well adapted to general purposes; but those who wish to avail themselves of an useful form, solely calculated for agricultural affairs, will find an excellent plan engraven in the 17th vol. of *Annals of Agriculture.*

Journal also denotes a critical account of literary performances. Of this kind we have several monthly publications, which, in general, do strict justice to the works that pass under review. In the present state of society, however, it has often been seriously lamented, that any journal should be made subservient to party principles; especiallly where religion or politics are concerned. Hence it has frequently been suggested, that, instead of anonymously undermining the reputation of literary works, and injuring literary property, reviewers ought, on such occasions, to affix their signature to every *critique*, and support their strictures by *fair* quotations selected from the book which is submitted to their judgment. Thus, their criticisms would become less *dangerous*, but more *authentic* vehicles of information. The character of a new work would likewise claim greater attention, from those who are in any degree acquainted with the merits of the reviewer: and, though a plan of this nature may probably, at first, meet with many objections, especially by those authors and publishers who are supposed to live upon friendly terms with the dictators of the secret tribunal; yet we hesitate not to say, that many and great advantages would eventually result from this candid and impartial measure. On the other hand, it is maintained, that the *free* republic of letters, by disclosing the names of critics, would be deprived of numerous valuable observations, which are equally pointed and instructive:—this powerful objection, however, appears to be inconclusive; because impartial justice is the first maxim of every moral institution. Besides, anonymous writers, when influenced by party-zeal (as frequently happens), possess an undue advantage over authors who risk their reputation before a discerning public; and, according to general principles of equity, every man has a right to know his enemy, provided he does not conceal himself in an ambuscade.

JOY, one of the most powerful mental emotions, accompanied with an extraordinary degree of pleasure. The effect of this sensation, if not too violent, invigorates the whole animal frame, and facilitates the cure of diseases.

Sudden joy, however, is often as injurious as the operation of either grief or terror; and many instances are recorded, in which the precipitate communication of unexpected news has proved immediately fatal. In order to prevent so dreadful a misfortune, such information ought not to be imparted, till the person to whom it relates, has been cautiously apprised, and thus prepared to undergo the various emotions and sensations that necessarily arise in an organized system. Hence we should fortify the mind equally, for encountering the most agreeable as well as the most disastrous tidings.

IPECACUANHA, a medicinal root imported from the West Indies. There are three kinds distinguished by the eye, namely, the ash-coloured, or grey, brown, and white; but the first of these is justly preferred; for it is more efficacious than the white, and less violent in its operation than the brown sort.

The ash-coloured ipecacuanha, as imported from Peru, is a small wrinkled root, bent and contorted into a great variety of figures; its cortical part is compact, brittle, and on breaking, presents a smooth, resinous surface; it has little smell, but a somewhat bitter and subacrid taste, so that it covers the tongue with a kind of mucilage.

According to Geoffroy, Neumann, Dale, and Sir Hans Sloane, the roots of a kind of dog's bane *(apocynum)*, are frequently substituted for the genuine ipecacuanha, and have in various instances produced fatal effects. But, if the above-mentioned characters be attended to, accidents of a similar nature may easily be obviated.

Ipecacuanha is one of the safest and mildest emetics, and possesses this peculiar advantage, that it passes off by the skin or bowels, if it should not operate by vomiting. In dysenteries, it is almost a specific, and often contributes to perform a cure in a very few days. When given in powder, its action is more certain than in any other form: hence it is now employed in many diseases, where full vomiting is indicated; for which purpose from 15 to 25 grains are prescribed for a full dose. It is also beneficially administered in very small doses, so as neither to operate by vomiting, purging, nor sweating; for instance, a third or fourth part of a grain, to be taken every half-hour or oftener, with a view to vellicate the intestinal canal, and by its nauseating effect, to give a different tone to the action of the stomach and bowels. Thus, it is recommended to be given in the paroxysm of spasmodic asthma, as well as in obstinate coughs; and a dose of 3 or 4 grains every morning, in chronical asthmatic cases.

IRON, the hardest and most extensively useful of the imperfect metals: it is naturally of a livid, whitish-grey colour, and found in great abundance in various parts of the world, both in a pure state, and intermixed with other fossil matters.

The iron manufactured in Great Britain is obtained from three different kinds of ores: 1. The *Lancashire ore*, thus denominated from the county where it abounds; being very heavy; of a fibrous texture; a dark purple colour, inclining to black; and lodged in veins like other metals. 2. The *bog ore*, which resembles a deep yellow clay, and has probably been deposited by some ferruginous rivulets: it is found in strata from 12 to 20 inches thick, and of various breadth. 3. *Iron stones*, of an irregular shape, which frequently lie in beds of great extent, and, like other stony masses, are sometimes intersected with seams or veins of pit-coal.

After the ore is dug out of the earth, it is crushed in a mill, and washed in a stream, in order to separate the grosser particles of earth. Next, it is melted in furnaces,

naces, heated with coke, charcoal, peat, or turf; near the bottom of which, by means of a tap-hole, the liquid metal is discharged into furrows made in a bed of sand. The larger mass, which settles in the main furrow, is called by the workmen, a *sow*; and the smaller ones, *pigs* of iron. Stoves, grates, &c. are formed by casting ladles full of the rough metal into proper moulds made of sifted sand. In this state it is called *cast-iron*; but, if cooled too hastily, it becomes brittle, and is apt to crack like unannealed glass: it is not malleable, and is so hard as to resist the file. With a view to improve it, the raw iron is now melted down a second time in another furnace, where a strong blast of air is impelled on the surface of the metal; in consequence of which its fusion is considerably facilitated, and the iron concretes into a mass called a *loop*, that is conveyed beneath a large hammer raised by the motion of a water-wheel. The metal is there beaten into a thick square form, again heated so as nearly to melt it, and then forged. By repeating this process, the iron is rendered perfectly malleable, and at length formed into bars for sale.

Lately, however, *cast-iron* has been reduced to a state of malleability, by passing it through rollers, instead of forging it. For this valuable improvement we are indebted to Mr. HENRY CORT, of Gosport, who in the year 1783, obtained a patent for preparing, welding, and working various sorts of iron, by means of machinery, &c.—As, however, this specification would be intelligible only to iron manufacturers, the inquisitive reader will consult the 3d vol. of the *Repertory of Arts, &c.* Yet justice requires us to observe, that the raw, or cast-iron is, by Mr. CORT's process, perfectly freed from those impurities which are not discharged by the common methods of rendering this metal malleable; and that it has been proved by experience to be equal, and, in some cases, superior, to the best Swedish iron. As Mr. C.'s patent is now expired, we trust it will be generally adopted at Birmingham, Carron, Colebrook-Dale, and the other iron manufactories of Britain; because the metal thus treated, may not only be procured at a cheaper rate than it is sold at present, but a saving will be made of *one million* sterling per annum, which is now paid to Sweden and Russia for bars, while we possess a sufficient quantity of the raw materials, which may be worked at home to that amount.

Beside the *cast* and *forged* iron, there is an intermediate state, in which that metal is soft and tough. This is called STEEL, and is usually made from the best forged iron, by cementation with certain inflammable matters: some account of the process will be inserted in its alphabetical series.

Iron being of such essential service for a great variety of purposes, several persons have obtained exclusive privileges for different inventions to which it may be applied.—Among these, the patent granted to Mr. JONATHAN TAYLOR (now expired) for casting oval-bellied pots, and nealing, turning, and finishing the same, &c.; then Mr. ROWLAND BURDON's, in 1795, for a method of making, uniting, and applying cast-iron blocks, to be substituted for key-stones, in the construction of arches; and Mr. JOHN WILKINSON's, in 1794, for making cast metal or pig iron from the ore, and manufacturing it into bar, or any other malleable iron, deserve particular notice.—The reader will find these, together with the various patents relative to the iron manufactory, minutely described in the different volumes of the *Repertory of Arts and Manufactures.*

Beside its utility as a material for implements of agriculture, &c. iron is eminently adapted to the purpose of dyeing cotton. From the various experiments made by CHAPTAL, it appears that the oxyd of iron has so great an affinity for cotton thread, that if the latter be immersed in a saturated solution of this metal in any acid, it assumes instantaneously a chamoy-yellow colour, which becomes more or less deep, according to the strength of the liquors, and the length of time it has been exposed to the air. The colour thus communicated is fixed; resists both air and water, and also alkaline leys; nor is its durability in the least affected by washing it with soap; which, on the contrary, imparts to it additional brightness. The oxyd of iron, if precipitated on any stuff, easily unites with the fawn colour obtained from vegetable astringents; and, by varying the strength of the soda, soap, or other mordants employed in dyeing, an infinity of shades may be produced. Thus, by means of a boiling heat, the oxyd of iron may be more intimately combined with the astringent principle. These colours may likewise be rendered brown, as they are susceptible of a variety of shades, from a bright grey to a deep black tint; by simply passing the cotton impregnated with astringent vegetable matter, through a solution of iron.

When long exposed to the air, iron is very liable to become rusty, especially in moist situations: hence an effectual method of preserving it bright, still remains to be discovered. Various compositions have indeed been contrived for this purpose; but none appears to be more serviceable than common oil, though its use is on many occasions both troublesome and disagreeable. To obviate these inconveniencies, it has been recommended to heat the iron to such a degree, that it cannot be touched without burning the hand, then to varnish it with new white wax, and expose it to the fire, till the wax is completely imbibed by the metal, which should next be rubbed over with a piece of serge.—According to others, this metal may be perfectly secured from the effects of rust, by plunging it, while red-hot, into linseed-oil, which is suffered to drop off till it become dry, and then wiping the iron with a clean cloth. Thus a black crust or varnish is formed, which renders it impervious to moisture. Again, others pour melted lead into the oil, before it is applied to the *heated* iron; but both preparations require a considerable degree of skill and precaution.

Iron, when imported in British ships from the United States of America, is exempt from duty; but if it be brought in American vessels, it is liable to a duty of 5s. 7½d. per ton, and 10s. 10d. per ton for convoy-duty.—The sum of 10s. 10½d. is paid on iron, whether in rods, or drawn, or hammered less than three-fourths of an inch square, if imported from Russia in British ships; but, if in foreign bottoms, it is subject to the duty of 11s. 3½d. per cwt.

In medicine, iron is chiefly employed as a tonic and corroborant: when properly prepared, it is given with advantage in diseases proceeding from laxity and inactivity of the digestive organs, such as indigestion, flatulency, colic, &c. It is also of considerable service in hypochondriacal affections, intermittent, tertian, quartan, and other fevers; but it seldom agrees with either bilious or plethoric constitutions, and is, like all active drugs, much abused by quacks and other pretenders, who should not be suffered to trifle with the health and lives of the multitude.

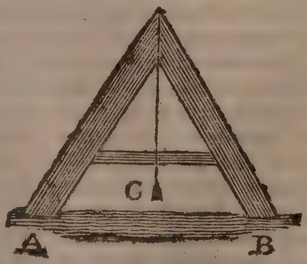
IRON-MOULDS, are spots on linen, occasioned by its exposure to damp situations, and also by ink accidentally dropped on the cloth. They may be removed by moistening the stained part, sprinkling it with a small quantity of the essential salt of lemons; after which the linen is to be rubbed over a pewter plate, and the blot washed out with warm water. But a less expensive method consists in wetting the spot, applying to it a few drops of spirit of salt, or lemon juice; then rubbing it for a minute or longer between the fingers, while it is carefully held over a hot smoothing iron, or a bason filled with boiling water, the steam of which greatly facilitates the removal of the stains.

IRRIGATION, signifies the watering, or artificial flooding of land.

The principal object in irrigating the soil, is a proper supply of water; and, if that fluid abound with mud, the land will be more permanently improved, than by conducting a clear spring over its surface: hence it is certain, that if the liquor collected in farm-yards, the washings of different sinks, ditches, and the drains of the contiguous fields, could be conveyed into the common stream, the water would acquire a more fertilizing property.

But, in order to manage this important branch of rural economy with success, it will be requisite previously to ascertain, whether the stream will admit of a temporary wear or dam being constructed across it; whether the water can be raised to such a height as to overflow a particular spot, without injuring the contiguous land; and whether it can be drawn off with the same facility as it is conducted on the soil. If these objects can be attained, the process of irrigation may be undertaken in the following manner:

When the descent cannot be determined with tolerable precision by the eye, an accurate level of the ground must be taken, and the most elevated part compared with the height of the stream to be employed. The instrument used for this purpose, is called a *water-level*; and, as the common machines are but imperfectly adapted to the purpose, we have subjoined the following representation of a simple implement for taking levels, contrived by Dr. JAMES ANDERSON; as it has been recommended to the notice of the public, by the Board of Agriculture.



It consists of two legs of common deal, A and B, about twelve feet in length, which are joined together at the top, and connected below by a cross bar, as above delineated. From the angle at the top, a plummet C, is suspended by a small cord; which, when a mark is made in the middle of the connecting bar, and the two legs are perfectly straight, will strike such mark, so that the level may be easily ascertained.

In the practical use of this instrument, Dr. ANDERSON directs a wooden pin, on which one of the legs of the frame may rest, to be driven into the ground at the level of the water, where the irrigation is intended to commence. The other leg is then to be brought round, till it touch the ground, on a level with the top of such pin, when another is to be driven in. After the level has in this manner been perfectly adjusted, the last mentioned pin is to be employed as a rest for one foot, and the other turned about, till the level is found in the same manner. Thus, the precise direction which the stream should take will at once be discovered, without any trouble, or incurring any additional expence by digging through heights or filling up cavities.

The level being taken as directed, a wide ditch is to be cut as near to the dam as possible, that the water may be conveyed to the highest part of the meadow; the sides and banks of the ditch being uniformly kept at an equal height, and elevated about three inches above the surface. Where the meadow is extensive, and the soil uneven, it will be necessary to have three works or dams in different directions, each of which should be five feet in width, if the meadow contain fifteen acres; and the highest part be the most distant from the stream. A ditch, ten feet wide, and three in depth, will, in general, be fully adequate to overflow ten acres of land; and if there be three works or dams in a meadow, and *flood-hatches*, or flood-gates, be placed at the mouth of each, when the water is not sufficient to irrigate the whole soil at once, it may be performed at three different periods; by taking out one of the hatches or gates for the space of ten days, at the expiration of which it is to be let down, and the other two taken up alternately for a similar period: thus each division will receive a proper share of water in its turn, and derive from it equal benefit.

Where the fall of the meadow renders it practicable, the bottom of the first work should be made as deep as the bed of the river; because the water, in proportion to its depth, will carry a larger or smaller quantity of mud with it, and consequently fertilize the soil in a more or less effectual manner. Small ditches, or troughs, ought likewise to be cut from the works at right angles, about 12 yards apart from each other, and their breadth should be adequate to the distance to which the water is to be conveyed: thus a trough two feet in width, and one foot deep, will irrigate a surface twelve yards wide, and forty feet in length.

It will, however, be requisite to provide the ditches with occasional flood-gates or sluices, especially when the water is rapid, in order to keep it sufficiently high to flow through the perforations in the gates, or over the sides. Between every second trough, a drain is to be cut at equal distances in a parallel direction, and of a proper depth for receiving all the water which overflows the adjacent lands, and conducting it to the principal drain with such rapidity, as to keep the whole stream in constant motion. For, if it be suffered to stagnate, it will be productive of the worst consequences; as the turf would become rotten, the soil be soaked without being ameliorated, and the land produce only coarse grass, rushes, or other aquatic weeds.

Where the meadows are cold, flat, and swampy, the width of the bed, that is, of the intermediate space between the trough and drain, ought never to exceed six yards. In such cases, the land cannot be too much intersected, especially when there is an abundant supply of water. The fall of the bed in every meadow ought to be in the proportion of one inch to each foot; for a rapid current always contributes to produce fine and sweet herbage; but the water ought never to flow more than two inches, nor less than one inch deep, except during the summer months.

Such is the method of irrigation practised in Gloucestershire, and likewise, with very few variations, in the counties of Wilts, Dorset, Cambridge, Hants, &c. Its advantages, indeed, are so important that, we trust, no rational agriculturist will hesitate to adopt the practice of floating land throughout Britain, in every situation where a command of water can be obtained.—Common meadows are not only enriched, but those of a swampy nature are consolidated by means of the mud conveyed on them. They are also protected from the effects of frost by the flowing water, or by the ice when it is frozen; hence the roots of grass remain unaffected by the cold, and excellent crops are thus produced so early, as to be of infinite service for spring food, before the natural grass appears.

By irrigation, good pasturage may be procured in the beginning of March; and, if the season be mild, much earlier. This crop is particularly excellent for feeding such cattle as have been *hardly* wintered; and so great are the benefits attending the flooding of lands, that the farmers of Gloucestershire are enabled to commence the making of cheese, at least *one month* earlier than those who do not possess the same opportunity. The utility of watering land is still farther evinced by this circumstance, that from the great forwardness of grass, the feeding between the months of March and May is worth one guinea per acre; in June one acre will yield two tons of hay; and the *after-grass* may always be estimated at twenty shillings, whether the summer be wet or dry.—The expence of irrigation is computed at from 3l. to 6l. per acre.

Land may be floated at any period of the year. In the months of December and January, the chief care consists in keeping the soil sheltered by the water from the severity of frosty nights. It will, however, be necessary to expose the surface to the air every ten days, or fortnight, during the winter, by laying it as dry as possible for a few days; and to discontinue the flooding, whenever the land is covered with a sheet of ice.

In February, greater attention is required; for, if the water be suffered to flow over the meadow for several days in succession, a white scum will be generated, which is very pernicious to the grass; and, if the water be drawn off, and the land exposed to a severe frosty night, without being previously dried for a whole day, the greater part of the tender plants will be totally destroyed.

In the beginning of March, the grass on well-flooded meadows will, in general, be so forward as to furnish abundant pasturage; when the water should be drained for the space of a week, that the soil may become firm, before heavy cattle be allowed to graze on such land: these, however, if the season be cold, ought to be supplied with a little hay every night, during the first week.

In the month of April, the grass may be eaten down closely; but no cattle should be turned in later; as otherwise the crop of hay will be much impaired; the grass become soft or woolly; and consequently its value be considerably diminished.

In the beginning of May, the water is again thrown over the soil for a few days, in order to moisten it; but the practice ought on no account to be continued during the summer; for it has an unfavourable effect on the *after-math*; and produces in sheep fed on it, the disorder called the *rot*.

Many other advantages arise from irrigation; but, as our limits admit only of giving an outline, we refer those readers who are desirous to acquire farther information relative to this interesting branch of rural economy, to Mr. G. BOSWELL's *Treatise on Watering Meadows*, &c. (8vo. 2s. 6d. 1780), in which the necessary implements, and terms employed in irrigation, are explained and illustrated with engravings; as likewise to Mr. WRIGHT's *Art of Floating Land*, &c. (2d edit. 8vo. Hatchard, 1799, pp. 95, 3s. 6d.); where the subject is perspicuously treated, and objections are ably answered.

IRRITABILITY, denotes that essential property of animals, in consequence of which their fibres, on being touched, contract or become short, in a greater or less degree.

Chemists have lately endeavoured to shew, that all animal and vegetable irritability originates from the *oxygen*, which is inhaled by the lungs, or respired by the leaves, or absorbed by the roots. And as respiration is every minute requisite to the support of animal life, Dr. DARWIN conjectures that something immediately necessary to their existence, is acquired by the lungs of animals from the atmosphere, rather than from the food they digest; and that this nameless something, perhaps oxygen, is mixed with the blood, and again separated from it by the spinal marrow, after having undergone certain changes in the course of its circulation, or secretion. In a similar manner, he considers it as probable that the spirit of vegetation may be derived from that source, namely, the uncombined oxygen of the air, which is respired by the upper surfaces of the leaves, and not from that which is absorbed by roots, in a more combined state: farther, that this oxygen is again separated from the juices by the *sensorium*, or brain, of each individual bud, after having undergone some change in its passage through the secretory vessels.

A long-continued, unusual, or unnatural stimulation of vegetable fibres, by an increase of heat, exhausts the spirit of vegetation: hence a slighter degree of cold will destroy such fibres; because, after having been excited for a considerable time by a more powerful stimulus, they will cease to act on the application of one that is weaker, so that in consequence of hot days, tender plants are more liable to perish from the coldness of the night. For this reason, gardeners inthe more northern climates, shelter both the flowers of apricots and the tender vegetables, during the spring-frosts, from the meridian sun, as well as from the destructive cold of the night, which is generally the most intense about one hour before sun-rise.

In the hot days of the month of June, 1798, Dr. DARWIN twice observed several rows of garden-beans to become quite sickly; and some of them even died, in consequence of being irrigated for one or two hours with water from an adjoining canal. This circumstance he attributes to the sudden application of cold, after the plants had been greatly enfeebled, and deprived of their irritability by the excessive heat of the season, rather than to the too copious watering of the dry soil. Some vegetables, however, such as strawberries, onions, &c. which were equally exhausted, are less liable to be thus injured, and even receive benefit from occasional irrigation in dry and sultry weather.

On the contrary, the spirit of vegetation acquires additional vigour, if plants have been exposed for a considerable time to a less than usual degree of heat; but, if they be suddenly removed from a cold to a warm place, they will experience a similar fate with those hapless persons, to whose frozen limbs sudden heat was imprudently applied: thus, too great increase of action occasions inflammation, which is generally succeeded by mortification and death. This fact has been ascertained and confirmed by the experiments of M. VAN USLAR, who kept two species of the spurge, or wartwort, namely, the *Euphorbia Peplus*, and *Esula*, L. secluded from the light and heat, with a view to render them more irritable: on exposing these plants afterwards to a meridian sun, they became grangrenous, and in a short time decayed.

The increased, or diminished, degree of irritability in plants, is by Dr. DARWIN attributed to their previous habits, with respect to the stimulus of greater or less heat. Thus, the periods at which vegetables thrive in the spring, appear to be greatly influenced by their acquired habits, as well as by their present sensibility to heat: hence potatoes will germinate in a much cooler temperature during the spring than in autumn; hence also, the vernal months are the most favourable to the process of making good malt; because the barley will then sprout with a less degree of heat than at any other season.

The irritability of plants has been discovered to be greater in the morning than at noon, and less in the evening than at mid-day; though it is considerably augmented during cool and rainy weather. In a similar manner, the limbs of animals acquire a greater sensibility of heat, after having been exposed to the cold: thus, the hands, after immersing them for a short time in snow, glow with warmth on entering the house;—and the late celebrated SPALLANZANI observed several animals and insects, that conceal themselves under ground in a torpid state during the winter, and enjoy the genial warmth of the spring, again to disappear at a season when the heat of the atmosphere was much higher than on their first emerging from their subterraneous abode.

From these considerations, Dr. Darwin infers, that such plants as are sheltered in a warm room, during the winter, ought to be occasionally exposed to a cooler atmosphere, in order to increase their irritability; otherwise their growth in the succeeding spring will be much retarded. For the same reason, the continual vicissitudes of the air and weather are essentially necessary to mankind; as the frequent changes of heat and cold have an obvious tendency to preserve or restore their irritability, and consequently the activity of the system. Hence not only the health and energy of men are more conspicuous in our variable climate, but their longevity is comparatively greater than on those tropical continents, which experience both a more considerable degree of heat, and a more steady atmosphere.

Ischury. See Urine.

ISINGLASS, or *Ichthyocolla*, a preparation from different species of a Russian fish, called sturgeon, of which we have given some account in the article Caviare. It may also be produced from the air-bladders of the cod, or *gadus*, as well as from those of other fish inhabiting fresh waters.

The method of making isinglass was for ages kept a secret with the Russians, but has lately been discovered: we extract the following process from the 63d vol. of the *Philosophical Transactions*:—First, the sinewy parts of the fish are boiled in water, till they are dissolved; then the viscid liquor is strained, and suffered to cool. When cold, the fat is carefully taken off, the liquor again boiled to a due consistence, then cut in pieces and rolled into a semi-circular twist, in which state they are suspended on a string, till carefully dried.

The sounds or air-bladders of fresh-water fish, in general, are the most transparent, flexible, and delicate substances, and consequently furnish the finest isinglass. But the intestines and *peritoneum* of the fish constitute inferior sorts of this article, denominated *book*, and ordinary *staple*. The *belugas*, being the largest and most plentiful fish in the Russian rivers, yield the greatest quantity of this animal glue, which, on account of its strength, is preferred to all other kinds.

Isinglass is most successfully prepared in the summer; as frost changes its colour, deprives it of weight, and impairs its gelatinous principle: but the forms into which it is twisted by the Russians, are useless, and frequently injurious to its native qualities. These peculiar shapes were probably adopted with a view to conceal the real substance, and thus to preserve the monopoly.

The Newfoundland and Iceland fishermen split open the fish, as soon as they are taken, and throw the back bones, with the sounds annexed, into a heap; but, before putrefaction commences, the sounds are cut out, washed and salted for use. In performing this operation, the best, namely, the intercostal parts, are left behind;—the Iceland fishermen are so sensible of this circumstance, that they beat the bone upon a block with a thick stick, till the *pockets* come out easily, so that they preserve the sound entire. This isinglass is dried upon nets in the open air, and resolves into fining like that of Russian manufacture, in sub-acid liquors, such as stale beer, cyder, old hock, &c. while, in equal quantities, it produces similar effects upon turbid liquors, except that it falls sooner and closer to the bottom of the vessel; though foreign isinglass, on account of the greater tenacity of its native mucilage, retains the power of fining preferably in warm weather.

With respect to the very extensive use that is made of isinglass by brewers, and wine-merchants, we have already expressed our disapprobation, under the head of CLARIFICATION; and also recommended proper substitutes, vol. i. p. 239, especially as H. JACKSON informs us, in his *Essays on British Isinglass*, published about the year 1765, that its yearly consumption in the brewery was *then* calculated at 25 tons weight, and that 40,000l. annually are paid for this article to the Russians. Hence it is sincerely to be wished, that this importation may be entirely superseded, as there is an adequate supply from the British colonies.

The finest and most transparent sorts of isinglass are consumed in making mock-pearls, and in stiffening linens, silks, gauzes, &c.—It may likewise be reduced to a jelly, as it dissolves in alkaline liquors; and even cold lime-water converts it into a pulpy mass. Although such preparation would be extremely detrimental to health in fining liquors, yet it may be usefully employed for another purpose; because, on mixing this jelly with compositions of plaster, lime, &c. for ornamenting walls exposed to vicissitudes of weather, it forms a firm and durable cement; and, if worked up with common mortar, it soon acquires the harshness of bricks. With this intention, however, it is more conveniently prepared by dissolving it in cold water, acidulated with oil of vitriol: thus, the acid quits the jelly, and forms with the lime a *selenitic* mass; while the jelly, being deprived of part of its moisture, speedily dries, and hardens into a firm body; whence its superior strength and durability may be easily explained.

In a medicinal view, isinglass is but seldom employed; though it may with advantage be used in violent bleedings from the nose, by introducing into the nostril a pessary made of soft linen, and dipped in a solution of this glue, prepared in equal parts of spirit of wine and water. Isinglass also forms a principal ingredient in *sticking-plaster*; and, when boiled in fresh milk to the consistence of a strong jelly, it affords a very nourishing food to invalids; though it should be eaten with precaution by those who possess a weak stomach, or digest slowly; as it has a great tendency to turn rancid and putrid.

ISSUES, are small artificial apertures or ulcers in the muscular parts of the body, for the purpose of draining superfluous moisture, or of giving vent to some noxious humours.

Issues are usually made in the arms, legs, or back, either by caustics, or by incision. They are chiefly applied in disorders of the head, eyes, ears, teeth, &c. which are thus relieved, and frequently cured. Inveterate complaints generally require two or more issues, to produce any considerable effect, namely, one in each arm, or on the arm and leg of one side of the body.

Artificial ulcers have been much recommended to the consumptive and asthmatic, though we doubt their efficacy when the patient's strength is already exhausted.—They have, nevertheless, often been found useful in cases of confirmed melancholy, when placed near the spine, as the unhappy victim of that disorder can seldom be induced to take any internal remedies. The discharge from these orifices may be promoted by the application of issue pease, and by dressing them with mild blistering ointment.

In order to close an issue, it is sufficient to discontinue the pea; but in case any proud flesh should arise, it may be removed by strewing on it finely powdered loaf sugar, or burnt alum: after which the wound will speedily heal, if it be properly dressed.

ITCH, a cutaneous affection, in which the skin is covered with small watery pustules, that appear first on the wrist, or between the fingers, then upon the arms, legs, &c. where they are accompanied with an intolerable irritating sensation.

The itch is contagious, but seldom prevails where due attention is paid to cleanliness, fresh air, and wholesome food. Unless it be improperly treated, it is in itself not a dangerous disease: but if it be too long neglected, the whole humours become corrupted; and if it be suddenly suppressed, without proper evacuations, it is apt to occasion fevers, inflammations, pulmonary consumptions, &c.—Hence the extreme absurdity of having recourse to ointments which profess to cure it in a certain number of days, or even hours: such imposition should be punished by the magistrate.

When the patient is of a gross habit of body, it will be necessary first to administer one or two brisk laxatives, before he can with safety resort to the tepid bath. The parts affected may next be rubbed alternately, every second day, one half of the body, with an ointment consisting of two ounces of flour of sulphur; two drams of crude sal ammoniac, finely pulverized; and four ounces of hog's-lard, or fresh butter. To this composition may occasionally be added a small portion of the essence of lemons, by which the disagreeable smell of the sulphur will be greatly suppressed.

During this treatment, the patient ought to keep the body gently open, by taking every morning and evening from 10 to 15 grains of the flour of sulphur in honey, treacle, or new milk. The same clothes ought to be worn in the whole course of the disorder, excepting the linen; and, when a cure is effected, the former should by no means be touched, till they have been properly fumigated with sulphur, as otherwise the contagion will again be communicated.

There is another species, called the *dry*, or *malignant itch*, which generally arises from the scurvy, and is very difficult to eradicate. In this case, the liberal use of antiscorbutics, and a vegetable diet, are of equal importance. A strong decoction of tobacco has often been found an efficacious external application. Mercurial ointments have likewise been employed with advantage, but their use requires great circumspection, as it is absolutely necessary to keep the bowels regular, by taking the mildest laxatives, and to guard against cold or catarrhs.

ITCH, a distemper in *cattle*, which is either occasioned by foul litter, and inattention to the skin of these useful animals, or is communicated from others; though it sometimes arises from a disordered state of the body.—Prof. BRADLEY directs the infected creature to be well washed with its own urine previously warmed, and mixed with stale salt butter.

JUICE, denotes the sap of vegetables, or the fluids of animals.—See BLOOD, PLANTS, SAP, &c.

The juices of several plants and fruits are expressed with a view to obtain their essential salts, and for various medicinal purposes: they are used either without further preparation, or converted into syrups and extracts. Such juices are generally obtained by simply bruising the plant in a marble mortar, and then submitting the pulp to a press: some vegetables, however, require the addition of water in the mortar, to express their juice with greater facility. The sap of most antiscorbutic plants, abounding with saline volatile principles, may be disposed to filtration, merely by pouring it in close bottles, and immersing them in boiling water: thus, the saline and volatile particles, in which their medicinal virtues chiefly consist, may be easily preserved.—See FILTRATION.

Fermentation is another method of clarifying juices that are susceptible of it; for all liquors which have undergone that process, spontaneously become pellucid.—See FERMENTATION.

Most vegetable juices coagulate, when exposed to the air, whether they are extracted from the plant by wounds, or flow from it without any external injury: in the latter case, however, it is generally the effect of a disease in the plant, either from a species of canker, or some other internal cause.

Different parts of the same plant often yield juices of opposite qualities. Thus, the sap in the root of the cow-parsnip is of a yellow colour; while that obtained from its stalk is white. The wild or strong scented lettuce, affords the greatest abundance of milky juice, of any known British plant. On wounding the stalk with a knife, there exudes a white ropy liquor; but, if an incision be made at the top of the stalks, a purple-tinged sap appears, as if cream had been sprinkled over it with a few drops of red wine. In a short time, it acquires a deeper purple, and thickens so, that finally a separation takes place, when the watery part floats on the surface.—See LETTUCE.

JULEP, a convenient form of medicines, which require no decoction, and are mixed up with syrup or sugar, in order to dilute them properly, or to cover their pungency.

Acid julep consists of 3 drams of weak vitriolic acid, 3 ounces of simple syrup, and 2 pounds of spring-water. These ingredients are to be gradually mixed, and the whole carefully strained.—See VITRIOLIC acid.

Amber julep: Let two drams of tincture of amber, and half an ounce of refined sugar, be mixed with 6 ounces of spring water, and strained in the manner above-mentioned. Under this form, the tincture of amber is rendered an agreeable medicine, which may be substituted for the amber itself, in nervous affections, &c. for which it is sometimes prescribed.

Æther julep is composed of 2 scruples of pure vitriolic æther, 6 ounces of spring water, and half an ounce of refined sugar, which ingredients are to be mixed and strained.—In spasmodic affections, this preparation is often given with advantage, in repeated draughts of about half a tea-cupful every hour, or oftener.

Saline julep, is a mixture of 3 drams of purified pot-ash and half a pound of water; to which are to be added, one ounce of the syrup of black currants, and half a pound of lemon-juice; or such a quantity of the latter as will be sufficient to saturate the alkali.—This compound is often used in febrile diseases, by taking two or three table-spoonfuls every hour, in order to promote a slight perspiration. It also increases the secretion of urine, and is frequently employed to restrain vomiting.

JUNIPER-TREE, or *Juniperus,* L. a native shrub, comprising several species; of which the principal is the *Juniperus communis,* or COMMON JUNIPER-TREE: it grows in many parts of Britain, upon dry, barren commons; on hills, or in vallies, in open sandy plains, or in moist and close woods, where it generally continues a low shrub: but, if planted in a good soil, it will attain the height of 15 or 16 feet, and produce numerous branches.

The juniper-tree may be propagated by the berries, if they can be procured in a ripe state. It is remarkable, that no grass will grow beneath this shrub; though the latter is said to be destroyed by the meadow-oat.

Juniper-berries possess a strong, not unpleasant smell; and a warm, pungent, sweet taste; which, on chewing, or previously well bruising them, is succeeded by a bitterish flavour. They require two years before they ripen, and yield, on expression, a rich, sweet, aromatic juice, bearing some resemblance to the taste of honey. These berries are useful carminatives; for which purposes a spirituous water, and an essential oil, are prepared from them. The Swedes eat them for breakfast, in the form of a conserve.—In Germany, they are frequently used as a culinary spice, and especially for imparting their flavour to *sauer-kraut.* The spirit impregnated with the essential oil of this fruit, is known by the name of GIN, to which we refer.

According to HOFFMAN, a *rob* is prepared of the liquor remaining after the distillation of the oil: it is passed through a strainer, and gently exhaled to a due consistence. This he recommends as a medicine of great efficacy, in cases of impaired digestion and debility of the intestines; it is also very serviceable to aged persons, labouring under diseases of the urinary passages. The rob is of a balsamic sweet taste, somewhat bitter, accordingly as the seeds have been more or less bruised. One of the best forms, however, is a simple watery infusion of the berries, or the tops, with the addition of a small quantity of gin: thus, a very useful medicine is obtained for dropsical patients.—LINNÆUS informs us, that the Laplanders are accustomed to drink such infusions as substitutes for tea and coffee.—The oil of juniper, when mixed with that of nuts, makes an excellent varnish for pictures, wood-work, and for preserving iron from rust.

The wood of the juniper-tree is of a reddish colour, very hard and durable: it is employed in marquetry and veneering; making cups, cabinets, &c. while the bark may be manufactured into ropes.—The charcoal made from this wood, affords the most durable heat, so that live embers are said to have been found in the ashes, after having been covered for 12 months.—The resin of this plant (gum SANDARACH), when powdered and rubbed into paper, is frequently used under the name of *pounce*.—Thrushes and grouse feed on the juniper-berries, and disseminate the seed in their dung.—The sprouts are eaten by horses, sheep, and goats.

IVORY, the tooth or tusk of an elephant, growing on each side of his trunk, and somewhat resembling the shape of a horn.

Ivory is much esteemed for its remarkable whiteness, its polish, and beautiful grain. DIOSCORIDES asserts, that if this substance be boiled with the root of mandragoras, for six hours, it may be rendered soft and flexible. By steeping small pieces of ivory in vinegar, or any other acid, they become ductile, and may be preserved in that state for a considerable time, by keeping them in common water. This hard substance may also be softened and whitened, by immersing it in a hot decoction made of red sage leaves, in double-distilled white-wine vinegar, with the addition of a little quick-lime. For removing spots, the ivory should be laid in unslacked lime, and a small portion of water poured on it, lest the heat be too intense, and the ivory scale, or become brittle. Others discharge the stains by merely steeping it for some time in strong lime-water.

Ivory may be dyed *green*, either in a solution of copper or verdigrease in aqua-fortis; or by grinding together two parts of verdigrease and one of sal ammoniac, and dissolving them in strong white-wine vinegar. Farther, by employing four ounces of aqua regia, and one ounce of sal ammoniac, a fine *purple* colour will be the result.

Ivory, bone, horn, and other solid parts of animals, may be stained *yellow*, by previously boiling them in a solution of one pound of alum in two quarts of water; then immersing them for half an hour in a liquor prepared by boiling half a pound of turmeric in a gallon of water, till it be reduced to three quarts, and afterwards plunging the coloured substance into alum water.—All bony matters may also be stained *blue*: they are first to be tinged with green, then dipped in a strong and hot solution of pearl ashes.—See also BONES, TORTOISE-SHELL, and WOOD.

Ivory may be prepared as a ground for miniature-painting, by cleansing the leaves or plates, and rubbing them over with the juice of garlic. This method is preferably recommended for removing its greasy quality, which prevents the colours from fixing on the ground, and is said to be more useful than either soap or ox-gall.

With respect to the medicinal properties of ivory, its shavings, like those of HARTSHORN, may, by boiling, be converted into a jelly, and possess similar restorative virtues.

IVORY-BLACK.—See vol. i. p. 278.

JURNUT. See EARTH-NUT.

IVY, the COMMON, or *Hedera Helix*, L. a native plant, growing in woods, hedges, and about old buildings: it flowers in the month of October.

This plant was first brought to Europe from Canada, and has been long cultivated in the British gardens, chiefly for the purpose of covering walls or buildings. It shoots almost 20 feet in one year, and gradually extends to the top of the highest building. It is easily propagated in autumn, by its trailing branches; and will thrive in almost any soil or situation; so that in the following October it is fit to be transplanted to those places where it is destined to remain.

The leaves of ivy possess a nauseous taste, though in Germany they are employed as a specific in the atrophy of children. Among the lower class of people in England, they are applied to issues; and the Scotch Highlanders prepare an ointment from the leaves, which is much esteemed for the cure of burns.—The berries are of a fine gold colour, and possess a slight degree of acidity: when swallowed by children or adults, they occasion vomiting, diarrhœa, and profuse sweating.—The roots of this plant are employed by leather-cutters to whet their knives.—BÖHMER informs us, that both the leaves and branches are useful in tanning.—Apricots and peaches, when covered with ivy during the month of February, have been observed to bear abundant fruit.—Horses and sheep eat the common ivy, but it is totally refused by cows and goats.

K.

KALE, the Sea, or *Crambe*, L. a genus of perennial plants comprising three species, one of which is a native of Britain, namely, the *maritima*, Cliff-kale, Sea-cabbage, or Sea Colewort. It grows on sandy soils, near the sea-coast, and flowers in the months of May and June.—This plant is relished by horses, cows, goats, hogs, and sheep. Its young and tender leaves are boiled and eaten as cabbage; but, when full grown, they frequently occasion giddiness.

The sea-kale is cultivated in many gardens as an esculent vegetable. It is also reared in pleasure-grounds, as a flowering perennial; because the stalks divide into fine branching heads of flowers. For either purpose, it is propagated by seeds, sown in autumn or spring in any common light soil, in which the plants are intended to remain. At the end of two years, they will produce shoots fit for use, and multiply exceedingly by the roots, which continue for many seasons.

KALENDAR, or CALENDAR, denotes either the distribution of time, accommodated to the purposes of life; or a table or almanack, comprising the order of days, weeks, months, &c.

There are various systems of chronological computation, according to the different forms of the year, and the division of time adopted in particular countries;

such as the Julian, Gregorian, and the new French kalendar.

The *Julian* kalendar received its name from JULIUS CÆSAR, the reformer of the old Roman kalendar, and is divided into periods comprising four years; the first three of which are called *common*, and consist of 365 days; the fourth has received the appellation of *bissextile*, or leap-year, and contains 366 days, on account of the six hours, which in the space of four years form a day, within a few minutes, and thus, in the course of 134 years, render it necessary to subtract an intercalary day.

For this reason, Pope GREGORY XIII. with the advice of able mathematicians, appointed that the hundredth year of each century should have no bissextile, excepting in every fourth century, on account of the deficiency of eleven minutes in the six hours of which a bissextile consists.

This reformation, or the *new style*, as it is now termed, commenced on the 4th of October, 1582, when ten days were omitted in the old kalendar; but that change was not introduced into Britain till it was enacted by the 24th GEO. II. c. 23, that the Gregorian computation should be adopted; and it accordingly took place in the year 1752.

The kalendar at present used by the French, was invented by FABRE D'EGLANTINE, during the late Revolution. It commences with the autumnal equinox, and is divided into twelve months, each of which contains 30 days, and three decades, or periods of ten days: thus, a decade is a day of rest, similar to our Sunday. To the 12th month, or Fructidor, are added five supernumerary days, called *sanculottides*: and that the reader may form some idea of the new French kalendar, we have annexed the following tables, in which the new and old methods of computation are placed in parallel lines:

Years of the Republic.	Gregorian Year.	Commencement of the French Year.	September.
10	1801—02	1801	23
11	1802—03	1802 S.	23
12	1803—04 B.	1803	24
13	1804—05	1804 B.	23
14	1805—06	1805	23
15	1806—07	1806 S.	23
16	1807—08 B.	1807	24
17	1808—09	1808 B.	23
18	1809—10	1809	23
19	1810—11	1810	23
20	1811—12 B.	1811 S.	23

B. Signifies *Bissextile*, or Leap Year;—S. *Sextile*, or French Leap Year.

By means of the next Table, the first day of each Month of the New French Kalendar, is made to correspond with that of the common Kalendar.

1. *Vendemiaire*, or Autumnal Month.	1. *Brumaire*, or Hazy Month.	1. *Frimaire*, or Hoar-frost Month.	1. *Nivose*, or Snow Month.	1. *Pluviose*, or Rain Month.	1. *Ventose*, or Wind Month.
22 Septem.	22 October	21 Novem.	21 Decem.	20 January	19 Feb.
23 ——	23 ——	22 ——	22 ——	21 ——	20 ——
24 ——	24 ——	23 ——	23 ——	22 ——	21 ——

1. *Germinal*, or Germinating Month.	1. *Floreal*, or Flower Month.	1. *Prairial*, or Meadow Month.	1. *Messidor*, or Harvest Month.	1. *Thermidor*, or Hot Month.	1. *Fructidor*, or Fruit Month.
21 March *	20 April *	20 May *	19 June *	19 July *	18 Aug. *
22 —— *	21 —— *	21 —— *	20 —— *	20 —— *	19 —— *
23 —— *	22 —— *	22 —— *	21 —— *	21 —— *	20 —— *

First Intercalary Day.
17 Septem. *
18 —— *
19 —— *

* When a Gregorian Leap-year occurs, one day must be subtracted from all those days in the year which are marked with an asterisk.

In the following Table, the first day of each Month of the common Kalendar is arranged according to the first day of the French Kalendar; and it deserves to be remarked, that when a Leap-year occurs, one day must be superadded to each of the following days.

Commencement of the year in the foregoing Gregorian year.	1 January	1 February	1 March	1 April
22 September	12 *Nivose*	*Pluviose*	11 *Ventose*	12 *Germinal*
23 ——	11 ——	12 ——	10 ——	11 ——
24 ——	10 ——	11 ——	9 ——	10 ——
	1 May	1 June	1 July	1 August
	12 *Floréal*	13 *Prairial*	13 *Messidor*	14 *Thermid.*
	11 ——	12 ——	12 ——	13 ——
	10 ——	11 ——	11 ——	12 ——
	1 Septemb.	1 October	1 Novemb.	1 December
	15 *Fructid.*	10 *Vendem.*	11 *Brumaire*	11 *Frimaire*
	14 ——	9 ——	10 ——	10 ——
	13 ——	8 ——	9 ——	9 ——

The Monthly Reviewers, in their Journal for March 1797, observe that the new French year appears to astronomers better calculated than our own; because its commencement forms a natural date in both the hemispheres, and its four quarter days coincide very nearly with the solstices and equinoxes. The French months, too, are of equal length; and divided regularly by their decades, without a fraction; by which the remembrance of dates, circumstances, &c. is considerably promoted. In the conclusion of their criticism, however, the Reviewers admit that the names are ill-adapted to the months, which are accommodated only to the climate of Paris: hence they are of opinion that these innovations, as well as those respecting weights and measures, ought to have been reserved for discussion in a congress for general pacification.

KELP, a term used to denote a species of pot-ash, employed in glass manufactories for crystallizing the *metal*.

Kelp consists of the calcined ashes of the sea-wrack and other plants growing on the sea shores, between high and low water-mark. The preparation of this useful article should be commenced in the spring; for, if the burning be delayed till the harvest is far advanced, the rainy season of autumn renders the process more tedious and difficult. —To prepare the materials for producing *kelp*, the sea-weeds should be cut with hooks or sickles; but the aspect of the shore, together with the time and rapidity of the tides, should be previously ascertained. If the coast be level, the plants may be speedily conveyed by horses and carts to the place where they are to be dried and burnt. On the contrary, when the shore is rugged, a strong rope should be laid at low water, around the cut grass; and, in order to increase the diameter of this rope, the longest sea-plants ought to be twisted round it. With the returning tide, the whole spot thus surrounded will soon be set afloat, and the cut vegetables may be readily collected; for, as the water advances, they may be gradually dragged towards the shore, by means of the rope serving as a net. To facilitate their removal, one end of the cord should be drawn through a ring, applied to the other end, and tightened so as to contract the plants into a small bulk: thus, they may be easily moved along with the tide.—After the herbage has reached the place of its destination, it must be dried in a manner similar to hay; coiled and stacked up for burning; proper care being taken to form the stacks, so as effectually to secure it from the rain.

With respect to the burning or melting of kelp, a process very tedious, and not strictly connected with domestic economy, the inquisitive reader may consult the 12th vol. of the *Repertory of Arts and Manufactures*; where it is minutely described.

KENNEL, or CHANNEL, generally signifies a small cavity or hollow for conducting water through the streets; but, in its present sense, it is peculiarly applied to denote a house or building for the reception of a pack of hounds.

A kennel ought to be situated on an eminence, in a dry situation, and in the vicinity of a brook or running stream. The strictest cleanliness is necessary, both for promoting the health of hounds, and also to preserve their sense sufficiently acute: for this purpose, kennels should be well aired, and strewed with fresh straw, to prevent the mange, or other infectious distemper. Mr. Beckford recommends these buildings to be erected in the vicinity of the mansion; and, on their first establishment, to construct them of the requisite capacity; because every subsequent addition impairs their external appearance.—Those readers who wish to acquire farther information on the management of the kennel, will meet with amusement in Mr. B.'s *Thoughts on Hunting*; of which, we understand, a new edition will shortly appear.

KERMES-MINERAL, one of the best preparations of antimony, which is so termed from its close resemblance to the insect called Kermes, or *Coccus ilicis*, L.—It is prepared by boiling together half a pound of crude antimony reduced to powder, and two pounds of purified pot-ash in eight pints of pure water, for fifteen minutes; stirring the mixture with an iron spatula; and then expeditiously filtering it while it is hot. The liquor is now suffered to stand in a cool place, where it soon deposits a powder that ought to be repeatedly washed, first with cold, and afterwards with hot water, till it be completely divested of its taste.

This medicine was originally contrived by Glauber, whose successor sold the secret of preparing it to the French King; in consequence of which, it was published in 1720.—If judiciously administered, kermes-mineral is a compound of great efficacy, on account of its exciting and evacuating properties. According to the quantity that is taken, it will operate either as an emetic, purgative, sudorific, or expectorant; for it is equally attenuating and resolvent, especially in disorders of the breast, proceeding from obstructions. The particular doses of this powder are mentioned in the accounts of the different disorders in which it is recommended; but, in general, *one grain* only is prescribed for adults, to be taken every third or fourth hour.

Kex. See Hemlock, the *Common*.

KEY, a well-known instrument employed for opening Locks, of which we shall give some account under that article.

Key also denotes an extensive wharf for the convenience of loading and unloading goods on board of merchantmen.—See Quay.

KIDNAPPING, a term which implies the forcible taking away or seizure of any man, woman, or child, from their native soil, and conveying them to foreign countries.—This atrocious violation of natural liberty has at all times, and in every nation, been held in just abhorrence. Few crimes, indeed, can be more heinous; for, independently of the anguish it must occasion in the hapless captive's family, it deprives the sovereign of a subject; exiles a man from his country, while it exposes him to dangers, and hardships. Hence, our common law punishes the criminal with fine, imprisonment, and pillory. The stat. 11 and 12 William III. c. 7, (though chiefly intended against pirates) contains a clause, by which it is provided that, if any captain of a merchant vessel, during his residence abroad, force any person on shore; or wilfully leave him behind; or even refuse to bring home such men as he carried out, in case they are able and willing to return; he is liable to suffer an imprisonment of three months.—Nevertheless, there is great reason to apprehend that such iniquitous practices are but too prevalent on the Coast of Africa, and in those distant climates, where the offender is too remote from the courts of justice, or whence it is difficult to procure the requisite evidence.

KIDNEY-VETCH, *Anthyllis*, L. an indigenous biennial plant, comprising several species, of which the *vulneraria*, or Lady's-finger, is the principal: it grows in meadows and pastures, in a chalky or calcareous soil; produces yellow flowers from May to August; and its seeds ripen in October.

In the cultivation of this vegetable, no particular care is necessary, farther than to keep it clean from weeds. It affords excellent pasturage for sheep. LINNÆUS remarks that, when the kidney-vetch grows on a reddish clay soil, the blossoms present a red colour: but, in white clay-land, they are uniformly white.—Although these flowers were formerly celebrated as vulnerary, yet we believe they might be more usefully employed as a dyeing material, and perhaps, as a substitute for *indigo*; because, in a dry state, they acquire a *blue* colour. Country people obtain from them a fine yellow dye.—The plant is relished by cows and goats.

KIDNIES, in anatomy, are those two viscera which separate the urine of animals. They are situated in the lower part of the cavity of the abdomen, on each side of the vertebræ of the loins, between the last false rib and the hip-bones. The right kidney lies beneath the great lobe of the liver; and the left, under the spleen: they are generally about five inches in length, three inches broad, and one inch and a half thick, in adults. Their excretory ducts are called *ureters*, or canals which convey the urine into the bladder.

The kidnies of animals are, in general, tough, acrid, and difficult of digestion: hence they ought not to be eaten by persons of a delicate habit, or of a sedentary life. Those of calves, lambs, and other young animals, may however be used with safety; as they afford a more palatable and congenial food.

INFLAMMATION of the *Kidnies*, or *Nephritis*, a painful affection of these parts, attended with a frequent discharge of water, which is either thin and colourless, or very red; with vomiting, coldness of the extremities, difficulty of breathing, numbness of the thigh, and other febrile symptoms.

The remote causes of this inflammatory disease are, stony concretions, external contusions, violent or long continued riding, strong diuretic medicines, such as the spirit of turpentine, &c.—The more immediate causes, are the same as induce other local inflammations.

Cure: In this, as in similar complaints, bleeding is the first remedy to be resorted to, especially by means of leeches. It will also be advisable to apply cloths immersed in hot water and wrung out, as nearly to the part affected as the patient can bear, and to renew them as often as they grow cool. Emollient clysters are also to be frequently administered; and the same treatment must be adopted, as has been already pointed out under the article INFLAMMATION.

Should these remedies fail to

afford relief, and the numbness of the part affected, together with the other symptoms, continue to increase, a suppuration will immediately ensue. In this disease, the patient must avoid all acrid, sour, and salted provisions, and subsist entirely on mild, mucilaginous vegetables. Butter-milk, if used to a considerable extent, has been found of excellent service, and in some cases, even proved a specific remedy for ulcerated kidneys. Goats' milk, and the balsams of Copaiva, or Canada, have been recommended as eminently useful.—Those persons who are liable to frequent returns of inflammation, or obstructions, of the kidneys, ought rigidly to abstain from wines, and all ardent spirits; their food should be of the lightest kind, and easy of digestion: they must likewise not attempt to lie on feather-beds, or be covered too warm; never sleep on their back; and carefully take daily, though moderate, exercise.

KIDNEY-BEANS. See vol. i. p. 205.

KILDERKIN, a liquid measure, consisting of two firkins; and two kilderkins make a barrel.—See FIRKIN.

KILN, a stove used in various manufactures. It also denotes a building for the admission of heat, in order to dry or burn certain materials deposited in such an edifice.—See BRICK, MALT, and LIME.

In 1796, a patent was granted to Mr. I. PEPPER, of Newcastle-under-Line, for his invention of a kiln, for the purpose of drying malt or other grain. As, however, this patent is not expired, and the ingenious inventor's plan would be understood only by architects, or builders, the curious reader will resort to the 5th vol. of the *Repertory of Arts*, &c. where it is illustrated with two engravings.

KING-FISHER, or *Alcedo*, L. a genus of birds frequenting every quarter of the world, and comprising numerous species; the principal of which is the *ispida*, or common king-fisher.

This bird is about the size of a swallow; of a clumsy shape; and the bill disproportionately long. But the great beauty and variety of its plumage amply atone for its inelegant form. The crown of its head, and the coverts of its wings, are of a deep blackish green, spotted with a bright azure tint; the back and tail exhibit the most resplendent shades: the whole interior side of the body is of an orange cast; and the tail, consisting of twelve feathers, presents a rich deep blue. When flying, in a bright day, the plumage of this bird exhibits a variety of the most dazzling colours.

The female king-fisher constructs her nest in holes scooped out of the sides of cliffs, to the depth of 3 feet; and deposits from five to nine eggs, of a semi-transparent white. She begins to lay early in the season, and excludes her first brood about the month of April; as the period of incubation does not exceed twenty days. While she is brooding, the male plentifully supplies her with fish; and, unlike most other birds, the female in that season is muscular and plump.

King-fishers are the most rapacious little animals that skim the deep; and, though of diminutive size, they devour almost incredible numbers of fish. Hence, their flesh is unfit to be eaten; but their beautiful plumage retains its lustre longer than that of any other bird.

King's Claver. See Common Melilot.

King's Spear. See Asphodel.

KINO, a gummy resinous substance, exuding from incisions made in a tree called *Pau de Sangue*, a native of the inland parts of Africa, but of which there is no botanical account.

From its sensible qualities, and also by its striking a black colour with a solution of green vitriol, this drug is remarkably astringent. It was first recommended by Dr. Fothergill, and is now often prescribed in diarrhœas, fluxes, &c. It affords an extract both in spirits and in water, but is more generally given in the form of a tincture, from one to two tea-spoonfuls, three or four times in 24 hours.

Kipper-nut. See Earth-nut.

KITCHEN, an apartment or room destined for the dressing of provisions, and preparing them for the table.

In 1794, a patent was granted to Mr. G. Stratton, for an improved *kitchen-range*, or stove, with an apparatus for the prevention of smoky chimnies. His invention is stated to be an improvement upon fire-places, by which great heat may be obtained from a small fire; by means of flues, connected either with the front, sides, back, or bottom of such grates, as occasion may require: it farther contains a contrivance for the immediate extinguishing of fire in chimnies; but, as his exclusive privilege is not expired, we refer the reader for particulars to the specification, given in the first vol. of the *Repertory of Arts and Manufactures*, where it is illustrated with an engraving.

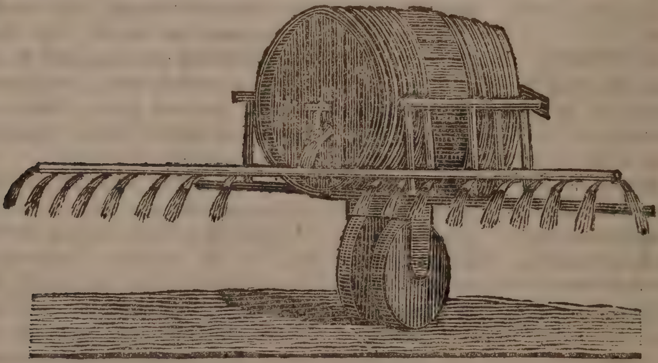
A patent was likewise granted in 1780, to Mr. Brodie, for his invention of a *ship's kitchen*, including a stove, hearth, smoke-jack and iron boilers. These contrivances, however ingenious, are not connected with domestic economy; and the curious reader will find them detailed in the 7th vol. of the work before quoted.

KITCHEN-GARDEN, a piece of ground laid out for the cultivation of fruit, herbs, pulse, and other culinary vegetables.

A kitchen-garden ought to be situated on one side of the house, adjoining to the stable, whence the dung may be easily conveyed into the inclosure. As soon as the wall is built, Miller directs a border to be formed beneath it, from 8 to 10 feet in breadth, on which, if in a southern aspect, the earlier plants may be raised. On those borders which are exposed to the north, some late crops may be obtained; but no pease, beans, or other deep-rooted plants, should be set too near the fruit-trees.

The ground is next to be divided into quarters, the size of which ought to be proportioned to the extent of the garden: because, if these divisions be too small, the soil will be wasted in walks; and as the quarters are generally inclosed by espaliers of fruit-trees, the vegetables which may be planted there, will not thrive for want of sufficient exposure. The walks should, therefore, be proportioned to the size of the ground; and in a small garden, they ought not to exceed 8 feet; or, if it be a large one, from 12 to 14 feet in breadth. It will also be advisable to place a border, 3 or 4 feet wide, between such walk and the espalier, in which may be sown small salads, or any similar vegetables, that do not take deep root, or continue long in the ground. These quarters, however, ought not to be planted, or sown, for raising the same crops two successive years; and the warmest soil, or that which is next to the stable, where it is best sheltered from the cold winds, will be the most proper for hot-beds, to promote the growth of early cucumbers, melons, &c.—The most important points in this, as well as every other branch of horticulture, consist in digging and manuring the land *well*; in allowing a proper distance to each plant, according to its different growth; and, particularly, in eradicating all weeds; an object that will be considerably facilitated by continually extirpating them from the dunghill; as, otherwise, their seeds or roots will be constantly introduced into the garden, and propagated with the manure.

Another circumstance of equal importance, is the *watering of gardens*, for which the implements commonly employed appear to be very inadequate. The filling, and carrying, of these vessels to the spot where they are to be used, are attended with great labour and loss of time. To remedy these inconveniencies, different machines have been invented: one of the most ingenious and useful, is that contrived by M. SYLVESTRE, and of which the following is an accurate representation:



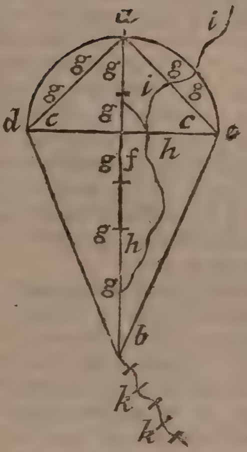
It consists simply of a cask, capable of holding a sufficient quantity of water, for the purpose of irrigating the garden. The hinder part of this vessel is furnished with a cock that communicates with the watering pipes, and the cask is supported on a strong frame, with one or two wheels, calculated for walks about 18 inches wide. The carriage may be drawn by a mule or an ass, and requires a person to guide the animal; to support the vessel when it is liable to be overturned; and to open and shut the cock as often as is necessary. Thus, one man will be able to water a considerable space of ground in a short time, and to sprinkle that fertilizing fluid in an equable and regular manner.

KITE, or *Falco Milvus*, L. a well-known bird of prey, which is a native of Europe, Asia, and Africa.

The kite is, by its forked tail, easily distinguished from the BUZZARD. The former is about two feet in length; but, with expanded wings, it measures upwards of five feet. The female deposits two or three whitish eggs, spotted with pale yellow; and, contrary to the nature of rapacious birds in general, the kite is said to breed *twice* in the year. Although the flight of this depredator is rapid, often soaring in the clouds, so as to become invisible, yet at such a distance he distinctly perceives his food, and descends upon his prey with irresistible force. Great damage is frequently occasioned in farm-yards, among chickens and other young poultry, by the voracious kite; though the enraged hen will sometimes intimidate and expel him.—We are not acquainted with a better method of exterminating this biped, than by means of the gun and powder.

KITE, ELECTRICAL, a well-known machine, which was originally contrived to serve as a toy for children, but which has lately been applied to the more useful purpose of conducting the electric matter of the atmosphere from the clouds.

Different kites have been constructed by CAVALLO, and other philosophers; and, though such contrivances are not very difficult, yet there are some fixed principles, which ought to be observed in manufacturing electrical kites to a certain degree of perfection. To accomplish this object, we have subjoined the following cut, together with the necessary rules, extracted from a treatise published in German, by the late Professor LICHTENBERG, of Göttingen.



The body of the kite consists of a long slender lath, *a*, *b*, and a wooden bow, *d*, *a*, *e*. The former must be made of slender, dry deal, properly planed, about five feet in length, one inch in breadth, and half an inch thick, so that it may neither be too heavy, nor too light to resist strong gusts of wind.

The bow *d*, *a*, *e*, is formed of a sound hoop, that may be taken from a dry cask; or it may consist of split cane or whalebone, rendered perfectly smooth, and of equal thickness. Particular attention, however, is requisite to adapt it to the proper size; for, if too weak, it will not be sufficiently elastic to expand the cord *c*, *c*. The dimensions of the bow must likewise be carefully adjusted to those of the lath *a*, *b*; and as the utility of the machine in a great measure depends on the accuracy of such proportions, we shall briefly state the rules by which they may be easily ascertained.

The two ends of the bow are

first to be contracted by means of the cord, which ought to be properly stretched. The middle of the bow must be exactly fitted to the lath *a*, so that one inch only of the latter project; and the place which is intersected by the string *c*, *c*, should be accurately marked. The lath, from this mark to its extremity *b*, ought to extend somewhat farther than double the length of its upper part.

Having found the proportion between the length of the lath, and the semi-circle of the bow, every thing depends upon the proper joining of these two essential parts. Hence a superficial excavation should be made at about an inch from the extremity of the lath *a*, and a similar cut in the centre of the bow; both are then to be brought into contact, and fastened with strong thread or silk.

The extremities of the hoop should now be made exactly of equal length; when one end is to be tied with thin packthread to the bow at *d*, about half an inch from the point; and, after having made small excavations into the lath *f*, on all its sides, one arm of the hoop *d* ought to be drawn close to the transverse piece; the packthread twisted several times round *f*; and at length tied to the other arm at *e*. Now the two sides from *d* to *f*, and from *f* to *e*, ought to be measured: if they happen to be unequal, the difference may be adjusted by pulling the thread towards the shorter side. Next, the thread is to be extended from *e* towards *a*, where it should be turned round several times; and thence conducted to *d*, the place in which it is fastened, so that it will form the angle *d*, *a*, *e*, as represented in the figure.—A small incision must farther be made in the part of the lath marked *b*, to which the thread is extended in the direction from *d* to *b*, and thence again to *e*, where it is ultimately secured.

Thus, the skeleton of the kite will be arranged; and it now remains to ascertain its equilibrium, which may be effected in the following manner: The end of the lath projecting at *a*, should first be rounded by the knife, and placed on a table, when the opposite end *b* is to be poised on the tip of the finger. If both sides of the bow are in perfect equilibrium, the skeleton is then complete; but, if either of them incline to one side, the want of symmetry may be remedied by cutting or shaving off the preponderating side of the lath, so as to reduce it to an equipoise. The frame, thus finished, is next to be covered either with silk stuff, or thin paper previously oiled, that it may resist the effects of moisture: and to prevent folds either in the silken or paper cover, they should be wetted before they are applied, and afterwards dried in a cool place. In order to secure the whole covering to the frame, narrow slips of silk or paper should be pasted across the lath, and over the packthread in all the parts marked *g*; and, when the whole is perfectly dry, its equilibrium must again be adjusted, by putting such additional pieces on the light side, as may be requisite to restore the balance.

In constructing electrical kites, it is of the utmost consequence to apply the string *h*, *h*, below the body of the machine to its proper place: when the latter is *five* feet long, the cord ought to be *eleven*, one end of which should be passed through the two holes of the lath;

namely, one in the direction of the uppermost slip marked *g*, *g*, and the other through the central part of the bow: then two similar holes must be perforated through the lath where the lowermost slip is denoted at *g*, that is, at a little distance from each other; and, after properly drawing out the string, so as to form an obtuse angle over the body of the kite, it ought to be well secured behind, and afterwards tied with a knot, exactly in the middle, to make both parts of equal length. Another difficulty might arise from the uncertainty of determining the exact point of the cord last mentioned, at which the main string governing the kite should be applied. Hence the following general rule requires attention; namely, that, according to the impetuosity of the wind, the principal string must be fastened higher towards the head of the kite, with a view to facilitate its rising; and, on the contrary, lower towards the middle, in less blowing weather. The most advisable method will be, to tie the leading cord at a few inches only from the upper hole, and to ascertain its exact situation by experience.

The tail of the kite, *k*, *k*, now remains to be fixed, and is perhaps the most critical part of the whole machine. If it be too short, the latter instantly descends; and, if it be too long, its weight prevents the kite from rising. The most effectual way to avoid both extremes, will be to make the tail seven times the length of the frame: fine packthread should be chosen for this purpose, and double or triple folded slips of paper, two or three inches long, ought to be tied into the pendent string, at short intervals; when the latter is to be affixed to the body of the kite at *b*.

With respect to the flying of this machine, an open place and a fine day should be selected, when a gentle breeze agitates the air: after launching it against the wind, the person who holds the string ought to advance speedily to the distance of thirty or forty yards; and gradually to relax the whole clue, accordingly as the rising is more or less rapid. In order to adapt kites to the *attraction of lightning from the clouds*, a thin metallic point is to be affixed to the highest end *a*, and connected with the string of the machine by means of a thin wire: In this application, however, the greatest caution is necessary; and those, who amuse themselves with experiments of such precarious nature, ought by no means to make the first attempt during thunder-storms, but only when the sky is serene: nor should any person affix a metallic point, or wind the wire round the string, or even moisten it, unless he be perfectly acquainted with the principles on which their joint action depends. Hence, smaller kites which do not ascend too high, must be first employed, till we become better acquainted with the rules of flying, and of fastening the machinery: thus, every danger may be obviated, and this apparently puerile contrivance, be rendered subservient to a very useful purpose.—The necessary directions for managing *electrical kites*, as well as the most proper conduct at the approach of, and during a thunder-storm, the reader will find under the articles LIGHTNING and THUNDER.

KNAPWEED. See Common BLUE-BOTLLE.

KNAWELL, or *Scleranthus*, L. a gea genus of plants comprising three species, one of which is a native of Britain; viz. the *annuus*, Annual Knawell, or German Knot-grass, which grows in sandy soils and corn fields; flowers in the months of July and August.

The Swedes and Germans introduce occasionally the steam arising from a decoction of the knawell into their mouths, with a view to cure the tooth-ach.—Its sweetish leaves are astringent.—Goats and sheep eat this plant, but cows totally refuse it.

KNEE-GRASS. See Rough PANICK-GRASS.

KNEE-HOLLY, or *Ruscus*, L. a genus of plants, consisting of several species, one of which is indigenous, namely, the *aculeatus*, Common Knee-holly, Butchers'-Broom, or Prickly Pettigree. It grows in woods, thickets, and hedges; flowers in the months of May and June.

This plant is much used by butchers, for brooms to sweep their blocks. Branches of it are likewise employed by hucksters, to defend their bacon and cheese from *mice*; because these vermin cannot penetrate through the prickly leaves.—The root of the knee-holly is reputed to be aperient, and is chiefly used in diet-drinks, for removing slight obstructions of the viscera, and promoting the fluid secretions.

KNOLLES. See TURNIP.

KNOT-BERRIES. See CLOUDBERRY.

L.

LABDANUM, or LADANUM, a resinous juice exuding from the *Cistus creticus*, L. a native of the Levant, whence it is imported. The best sort (which is extremely rare even in Turkey) consists of very dark-coloured, soft masses, and almost liquefies, when held in the hand: it emits an agreeable odour, especially while burning, and has a slightly pungent, bitterish taste.—This medicinal drug is chiefly used externally, for attenuating and discussing tumors.

LABOUR, in a general sense, implies the exertion of human strength in the performance of any kind of work.

The *price* of labour has, at all times, varied; and, as the poorer classes feel, with additional rigour, every evil arising from the pressure of the times, different expedients have been devised, with a view to alleviate their burdens, supply their wants, and render them more comfortable.

From these investigations, it appears that, in the middle of the fourteenth century, the usual price of labour was 2d. per day; and wheat was sold at from 3s. 4d. to 4s. per quarter.

In the middle of the fifteenth century, the pay of a labourer per day, was 3d.; and wheat cost from 5s. to 5s. 6d. per quarter.

In the earlier part of the sixteenth century, the price of labour rose to 3½d. and that of a quarter of wheat to 7s. 6d. About the middle of the 17th century, the pay of a labourer,

bourer, upon an average, was (in Essex) 13d.; and corn had risen to 40s. per quarter.

Toward the latter end of the 18th century, the daily pay of a labourer was from 14d. to 18d. in the country, and from 2s. to 2s. 6d. in the metropolis; while the price of wheat was 48s. per quarter.—We forbear to state the average pay of labour during the late exorbitant prices of grain, and every other article of food; when all proportion between *merit* and *reward* appeared to have been suspended.

The payment of *daily* wages, however, serves but imperfectly to ascertain the *real* price of labour; as a considerable portion of work is performed by the piece; so that a labourer in general earns from 3d. to 6d. per day more than by the common pay. For, without this, or some similar method, the reward of labour would be inadequate to the maintenance of those numerous persons, who possess no other means of providing for their infirm wives, or hapless children. And we conceive, that if their wages could be so regulated, as to rise and fall with the price of wheat, considerable benefit would thus result to society.

The rapid increase of *poor-rates* throughout the kingdom, can be attributed only to the low and insufficient recompense of labour, in consequence of which, the poor are obliged to resort to the parish for relief. Indeed, when the average price of wheat for the last ten years is considered, we presume not to exceed the limits of moderation in saying, that no *country labourer*, in the full possession of his health and strength, ought to be paid less than the value of a half-peck loaf per day, according to the price of wheat, and a proportionable sum by piece-work. In populous towns, however, an addition of 20 per cent. should be allowed, if vegetables and butchers' meat are sold at the present unreasonable prices.

The curious and philanthropic reader, who feels an interest in this popular inquiry, will be fully gratified by a perusal of Mr. DAVIES's *Case of Labourers in Husbandry stated and considered*, &c. (4to. pp. 200, 10s. 6d. Robinsons, 1795), and Sir F. M. EDEN's *State of the Poor*, &c. (3 vols. 4to. 3l. 3s. White, 1797), in which the situation of the labouring classes is clearly developed.

By the 2d and 3d EDW. VI. c. 15, all labourers who combine or conspire together concerning their work or wages, incur a penalty of 10l. for the first offence, which sum is doubled in case of repetition; and, if the money be not paid, they are to be set in the pillory. Justices of the peace, and the stewards of courts leet, &c. are likewise empowered by the 4th EDW. IV. c. 1, to hear and determine all complaints relative to the non-payment of labourers' wages; which, by the stat. 5 ELIZ. c. 4, are to be annually settled for every county, by the sheriffs and justices of the peace, in every Easter session; and in corporations, by the chief magistrates, under certain penalties in case of neglect. And such assize, when made, is ordered by the 1 JAC. I. c. 6, to be proclaimed.

Beside these laws, in behalf of the labouring classes, others have been enacted, for the benefit of the employer. Thus, by the stat. 4 ELIZ. all persons who are fit for labour, are compellable to serve, by the day, during the season of making hay, and the corn-harvest; but those labourers, who have obtained proper testimonials, are permitted to go into other counties. It is farther provided, that such labourers, from the middle of March to the middle of September, ought to work from 5 o'clock in the morning till 7 or 8 at night; being allowed two hours for breakfast and dinner, and half an hour for repose during the three hottest months: in the other six months of the year, they are obliged to work from twilight to twilight, excepting one hour and a half for breakfast and dinner, on the penalty of forfeiting one penny (at present it should be two-pence) for every hour's absence.

LABURNUM, the BROAD-LEAFED, *Cytisus laburnum*, L. a valuable exotic tree, introduced from the Alps, into the Highlands of Scotland.

This plant is very hardy, and will thrive on poor shallow lands, and in exposed situations: it is propagated by seeds, which should be deposited in March, in a light and rather moist soil, where the tree is intended to remain; and, in the succeeding month, young shoots will appear. But, if sown in autumn, the seeds do not germinate till the following spring.

The broad-leaved laburnum forms an agreeable ornament for parks and gardens; as it grows rapidly, with a straight stem, and, in the course of four years, is generally twelve feet high.—Its wood is frequently employed on the Continent, and in the Highlands, for making chairs, tables, and other articles of household furniture, which are said to resemble the finest mahogany.—SUCKOW remarks, that a decoction of the fresh branches and leaves of this tree, imparted an excellent dark-brown colour to cloth prepared in a solution of green vitriol.

LABYRINTH. See MAZE.

LAC, or GUM-LAC, a species of wax, with which the Lac-insect, or *Coccus Lacca*, L. that frequents several species of the fig-tree, forms cells resembling the honey-combs of bees.

Gum-lac has received various names, according to the different states in which it is obtained. The *stick-lac* is the wax adhering to the smaller branches of the tree, and which is unprepared. This is first separated from the twigs to which it is attached; and after being grossly powdered, and divested of its colour, by digesting it in certain liquors, is called *seed-lac*. When the stick-lac is melted over a moderate fire, then freed from its impurities, and formed into cakes, it is denominated *lump-lac*. The last species is termed *shell-lac*, and is prepared by liquefying, straining, and reducing the cells into thin transparent plates, in a manner peculiar to the natives of India.

Lac is applied to various purposes of ornament and utility.—Considerable quantities are used in the making of sealing-wax; in japanning; for varnish; and in painting. It also imparts a fine red colour to silk and cotton, when these have previously been immersed in a weak decoction of the bark, known among dyers by the name of *load*.

Lac is likewise of service as a medicine: for which purpose the *stick-lac* is in great esteem on the Continent, especially for relaxed and spongy gums, arising from cold, or from a scorbutic habit.—With this intention, it is either boiled in water, with the addition of a little alum for promoting its solution, or it is used in the form of a tincture, prepared with rectified spirit: the latter has a grateful odour, and a bitterish, astringent, though not unpleasant taste, and is chiefly recommended in scorbutic and rheumatic disorders.

LACE, in commerce, a texture composed of several threads of gold, silver, silk, or thread, which are interwoven and worked on a cushion with spindles, according to the pattern designed.

There are various kinds of lace, denominated either from the place where they are manufactured, or from the particular method of working. Such are Point, Brussels, or Flanders lace, made in the Netherlands; and blond or bone-lace, which is produced in England, chiefly in the county of Buckingham.

When gold or silver lace happens to be tarnished, the best liquid that can be used for restoring its lustre, is spirit of wine, which should be warmed, before it is applied to the tarnished spot. This, in Dr. Lewis's opinion, is far preferable to soap, or the alkaline liquors usually employed; as the former does not remove the colour of the silk or other embroidery, with which the lace may be connected.

Method of separating gold or silver from lace, without burning it: Let the lace be first cut to pieces, tied up in a linen cloth, and boiled in soap-ley, till its size be considerably diminished: the cloth is now to be taken out of the liquid; rinsed repeatedly in cold water; and beaten with a mallet, in order to extract the alkaline particles. On opening the linen, the metallic part of the lace will be found pure, and undiminished, while it retains its natural brightness.

All laces, whether made of leather, gold, silver, or of thread, are prohibited to be imported; but, if any lace composed wholly of silk, or of silk mixed with any other materials, be imported, the goods are to be burnt; and by the stat. 3 Geo. III. c. 21, the importer incurs a penalty of 100l.

LACKER, or Lacquer, is a kind of varnish, applied to brass, tin, and other metals, in order to improve their colour, and to prevent them from tarnishing.

The best lacquer is prepared from rectified spirit of wine, and *seed-lac*, in the proportion of three ounces of the latter to one pint of the former. The mixture is digested for some hours in a moderate heat; when the liquor is strained, and left to subside. In this state, it is ready to receive the shade required, by adding gamboge, annotto, or other tinging drugs.

With a view to impart a golden colour to metals, two parts of gamboge are usually added to one of annotto; but, a better method is, to dissolve those substances separately, and to ascertain the particular shade, by mixing different proportions of the two solutions. If silver or tin are to be lacquered, it will be necessary to employ a larger quantity of the colouring matters than is required, when this kind of varnish is to be applied to brass.

LACTEALS, in physiology, are the absorbing vessels of the mesentry, and consist of certain small tubes, situated in the intestines; whence they convey the *chyle*, or that milky fluid which is generated from the food in the first passages, into the common reservatory, or the mass of the blood. They are furnished with an incalculable number of valves, which prevent the return of the chyle into the stomach: in their passage through a number of glands, the nature of the last-mentioned fluid is considerably altered, and prepared for its assimilation with the blood.

Ladies' Bed-straw. See Cheese-rennet, and Goose-grass.

Ladies'-hair. See Quaking-grass.

Ladies'-finger. See Kidney-vetch.

LADIES'-MANTLE, or *Alchemilla*, L. a genus of plants comprising four species, three of which are indigenous, and of these, the principal is the *vulgaris*, or Common Ladies'-mantle, growing frequently in meadows and pastures: it flowers from June to September.

This plant might be easily cultivated, either by dividing the roots, or scattering the seed in autumn. It requires a moist soil, a shady situation, and to be kept clean from weeds.

The leaves of the ladies'-mantle are mildly astringent; though at present seldom used in medicine. —According to Gleditsch and Bautsch, the whole plant may be advantageously employed in tanning.—Horses, sheep, and goats, eat this vegetable, but it is not relished by cows; and hogs totally refuse it

Ladies'-seal. See Black Bryony.

LADIES'-SMOCK, or *Cardamine*, L. a genus of plants consisting of sixteen species, seven of which are indigenous: the principal of these is the *pratensis*, or Common Ladies'-smock, growing in meadows and moist pastures; it flowers in the month of May.

According to Dr. (now Sir George) Baker, the flowers of this plant may be used with great advantage in hysteric and epileptic cases, if taken twice a day, in doses of from 20 to 90 grains each. In Cornwall, the flowering tops have successfully been employed for the cure of epilepsy, for several generations. Goats and sheep devour this herb, but cows dislike it, and neither horses nor swine will touch it.

LAKE, in geography, a collection of waters of a considerable extent, and having no immediate communication with the ocean.

Lakes are divided into two classes: 1. Those, which contain fresh water; and, 2. Such as are saline. The chief lakes in England are those of Keswick and Winander-mere, in the northern counties: there are likewise several in Scotland, which are distinguished by the name of *Lochs*.

In cold climates, lakes are of considerable utility; for the warm vapours exhaled from them, mitigate the intense frost that prevails during the winter season. They are of still greater advantage in the southern regions, when situated at a distance from the sea; because the evaporation caused by the heat of the sun, refreshes the adjacent country with frequent showers, and thus renders it a beautiful garden. Beside the genial temperature to which the British lakes greatly contribute, they contain abundance of fish, and might be rendered still more profitable by conveying to them the spawn of fish from rivers, by means of jars. (See also vol. ii. p. 296). This method hath been long practised in China, and, we conceive, might be productive of great advantages, if it could be adopted in this country.

LAKE, in the imitative arts, signifies a red colour employed by painters, which was originally formed of *gum-lac.* It is at present prepared chiefly from scarlet rags, cochineal, or Brazil-wood. The best, however, is obtained from the first of these articles, in the following manner:

First, let a pound of pearl-ash be dissolved in two quarts of water, and the solution be filtred through paper. A pound of clean scarlet shreds, and two quarts of water, are next to be added to the liquor, and the whole boiled till the rags are perfectly divested of their tinge; when they are to be taken out and pressed. Three additional pounds of shreds are now to be boiled in the same solution; and, during this process, a pound and a half of the bone of cuttle-fish are to be dissolved in one pound of aqua-fortis. This liquid is next to be combined with the former solution; and the whole, on being suffered to subside, will deposit a sediment, which forms what is called *lake.* The liquor is then to be strained, and the sediment mixed four or five times, successively, in two gallons of spring water, till all saline particles are extracted; lastly, it is to be drained, and dropped through a funnel on clean boards, when the lake will assume the form of cones or pyramids, in which it must be suffered to dry, and the preparation will be fit for use.

For a more simple method of preparing different lakes, or pigments, the reader will consult p. 38 of our 2d volume.

LAKE-WEED. See WATER-PEPPER.

LAMB, the young of a sheep; which, if a male, is during the first year, called a *wedder*, or *wether-hog*; and if a female, a *sheave.*

The most proper time for ewes to *lamb*, is from the latter end of April to the beginning of June; and, in the course of 16 or 18 weeks, the young animals may be taken from their dams: they are, however, very tender, and require the greatest attention, especially during snowy weather, when they not unfrequently perish from want of fresh grass, and their aversion to eat hay. In order to remedy this inconvenience, it has been recommended to turn a few old sheep that are generally fond of hay, among the lambs, which will thus be speedily induced to follow their example.

Lambs are subject to few disorders:—when they are sick, the drinking of mare's or goat's milk, diluted with warm water, will greatly tend to preserve them from taking cold; and as many, when yeaned, are apparently dead, it is advisable to blow into the mouth and nostrils; by which simple method numbers have been immediately restored.

The most fatal distemper, however, with which lambs are affected, is the *blood* or *red-water.* The disordered animals are, in general, seized with lameness, and a slight swelling of the joints, but which is attended with a violent inflammation, that spreads over the whole body, and, if neglected, proves fatal in the course of 24 hours.

The red water is occasioned by too great a quantity of undigested food remaining on the stomach. As soon, therefore, as the lambs are attacked, the best method hitherto known is, to take them from grass, bleed them, and administer an emollient clyster, which is to be repeated, in case no evacuation take place in a short time. Two or three grains of tartar emetic, or as many ounces of sweet-oil, are now to be given, and the bleeding repeated, if the animals do not appear to recover. This treatment is to be continued for the space of four or five days, during which the diseased creatures should be fed with milk.

Lamb forms a considerable article of food: being light and wholesome, it is well calculated for weak and delicate stomachs, though less nourishing than mutton. *House-lamb*, which is thus denominated from the animals being fed and fattened within doors, is neither so wholesome nor so nutritive as the natural meat. Its flesh is devoid of taste, and eaten only by epicures; who, regardless of the dictates of reason, and the rules of temperance, attend only to the gratification of their sensual appetites.

Lamb's-lettuce. See Corn Salad.

Lamb's-quarters. See Wild Orache.

LAMENESS, a weakness that may arise from various causes, in any part of the body.

Where this defect originates from natural deformity, it is generally incurable: few instances, however, occur in which lameness is hereditary; though it may also be induced by causes that are difficult to be discovered. If it be occasioned by external accidents, such as luxation of the thigh at the birth, fractures, &c. it can be cured only by a skilful reduction of the dislocated limbs, though it will always be attended with *halting*.

Frequently, however, the leg, in consequence of the rigidity of the muscles destined to put it in motion, contracts to such a degree that it cannot be moved without limping. In this case, it will be advisable to apply emollient fomentations; to immerse the part affected in mollifying baths; or, for very robust individuals, to expose it frequently to the action of a pump from mineral springs, and to wear a shoe furnished with a leaden sole, the weight of which should be proportioned to the contraction of the limb.

Much lameness, as well as deformity, might certainly be prevented, if a stricter attention were paid to the early treatment of children. These are often afflicted with a weakness of the hips, accompanied with a lameness of both sides of the body; which is wholly occasioned by inducing them to walk without any assistance, before they have attained sufficient strength to support themselves. Such debility may, in some measure, be counteracted by tying a girdle round the waist, that should extend to the whole circumference of the belly; and which, if well braced at the hips, will invigorate the loins, while it gradually enables children to walk. It will also be advisable to bathe such weak limbs in astringent decoctions, frequently in the course of the day, for several months.—See Rickets; and also vol. ii. p. 218.

Beside these common causes of lameness, there are various other circumstances which our limits will not permit us to discuss, as they relate peculiarly to surgery. A practical work on this subject is much wanted; and we conceive it would be of essential service to society, if a popular treatise were properly executed, in which the manifold causes of lameness might be discriminated, and the most appropriate remedies judiciously stated, according to the different stages of the affection.

Lameness, *in Horses*. See Halting.

LAMP, a vessel containing oil, or other inflammable matter, for the purpose of affording light.

The utility of lamps in domestic life, is universally acknowledged; we shall, therefore, proceed to state such patents as have been granted for the inventions or improvements relative to this branch of manufacture, without discussing those theories in which ingenious men have occasionally indulged.

The first we shall notice is, that of M. Argand, who obtained a patent in 1784: his privilege being now expired, and his invention generally adopted, we shall briefly observe, that the superiority of his lamp depends on the admission of a larger volume of air to the flame, than is practicable on the common plan. This object is effected by employing a circular wick, so that a strong current of air rushes into the cylinder round which the wick is placed, and thus, together with the atmosphere, excites the flame to such a degree, that the smoke is entirely consumed. The light and heat are by this method remarkably increased, while the expence of the oil is considerably reduced; because those particles, which, in the usual lamps, are dissipated in smoke, will, by M. Argand's invention, be converted into a brilliant flame.

A patent was granted in 1787 to Mr. Miles, for his new method of making lamps of different forms, so as to emit an undiminished light, however it may be agitated; and which may also be fixed in halls, shops, &c.—As its specification is too complex to be understood by those who are unacquainted with the manufacture, inquisitive readers will consult the 3d vol. of the *Repertory of Arts and Manufactures*.

Another patent was obtained in the same year, by Mr. Peter Keir, for a contrivance of raising the supply of oil in lamps. The whole effect is produced by the application of another fluid, the specific gravity of which is greater than that of oil; and which communicates with the latter, by means of certain receivers, tubes, or conductors. These are so arranged, that the heavier liquid may press a column of oil upwards to any requisite height, for the purpose of supplying the lamp.

Farther, by prolonging the conductor of the heavier fluid beneath the lower surface of the column of oil, the weight of the former will hydrostatically act upon such surface, and raise the column. Thus, the lamp will not only be furnished with the purest particles of oil from the upper part, but the flame will also be considerably elevated above the body of the vessel; and, being supplied from a contracted surface of oil, it will consequently afford a more diffused light, with a considerable diminution of shade. For a more minute account of this ingenious contrivance, we refer the inquisitive reader to the 8th vol. of the work before quoted.

The last patent we shall notice, was granted in 1800 to Messrs. White and Smethurst, for their *improved lamp-burner.*—The whole is modestly called an improvement on the burner of the common Argand lamp; and the object of which is, to afford a more free and plentiful supply of oil to the ignited part of the wick; so that it will burn better, require less frequent snuffing, and answer well, even with oil of an inferior quality. These advantages are obtained simply, by leaving a larger than the usual space between the two tubes, within which the wick is placed. Yet it is necessary to contract such space towards the top, in order that the burnt crust or cinder may be more conveniently removed; an object which may be effected by applying a ring or piece of metal, conically or otherwise formed, so as to reduce the space in the upper part of the lamp to the usual dimensions.

The advantages of Messrs. White and Smethurst's improvement, are: 1. That the inconvenience hitherto complained of, respecting the mode of cleaning and dressing the lamps, is thus removed; as, upon their plan, the capillary tubes of the cotton wick are prevented from being at any time obstructed by the viscid nature of the oil, while its ascent is promoted by such capillary attraction. 2. The quantity of oil consumed by these improved lamps is, by the patentees, stated to be less, in the proportion of at least four to five. 3. One of the most important advantages thence derived, is, that of the wick being rendered fit to burn common whale, or seal-oils, which are sold at about half the price of the best spermaceti oil, the only inflammable fluid hitherto used in Argand's lamps; while the former produce an equal degree of light.

We have already pointed out (in vol. i. p. 432, article Candle) the superior utility of lamps, especially for sedentary and studious persons; but as the light emitted by them is frequently too vivid for weak, or irritable eyes, we would recommend the use of a small screen, which should be proportionate to the disk of the flame, and be placed at one side of the light, in order to shade it from the reader's eye, without excluding its effect from others, or darkening the room. Such a contrivance is equally simple and useful: it may consist either of paper, or taffety, slightly gummed; and, being easily folded and carried in the pocket, is far superior to the common screens.

We cannot conclude this article, without pointing out another circumstance in which lamps are superior to candles, namely, their *cheapness*. From experiments made some years since, with the express view of ascertaining the expence of burning chamber-oil, it appears that a common taper-lamp, with eight cotton threads in the wick, consumed in one hour $\frac{325}{1000}$ parts, or about one-third of an ounce of spermaceti oil, which at that time cost 2s. 6d. per gallon; so that the expence of burning for 12 hours, amounted to 4·57 farthings, or about $1\frac{1}{8}$ of a penny. The light emitted by such lamp, was as clear and bright as that yielded by candles, which run from eight to ten in the pound.—Subsequent trials were made with M. Argand's lamp; the result of which was, that the latter will continue to burn *three* hours for the value of *one* penny. And though a candle, when newly snuffed, may appear to be preferable, yet the lamp is ultimately superior, both for steadiness and durability of light. Nay, one good lamp proved equal in its effect to half a dozen tallow candles, consisting of six in the pound, the expence of which was *eight-pence*, while that of the lamp amounted only to *two-pence halfpenny*, in the space of *seven* hours.

LAMP-BLACK, is one of the black colouring matters, the preparation of which has already been stated, vol. ii. p. 35.

We again introduce this substance, as it possesses several remarkable properties: thus, lamp-black is liable to undergo spontaneous inflammation, if it be kept for some time closely confined, and be afterwards suddenly exposed to the air: there have been instances of its taking fire in shops, and occasioning the most distressing scenes of conflagration. But, when lamp-black is combined with oil, so as to form a black varnish, it appears from various experiments, that bodies painted with this compound resist the effects of electricity in a most surprizing degree; and that they have, in a variety of cases, even repelled lightning.

In 1798, a patent was granted to Mr. WILLIAM ROW, for a new-invented mineral lamp-black. This is obtained from pit coal, or any other kind of fossil coal; the blackest particles arising from the smoke of which, are deposited in certain tubes, or receptacles, whence they are removed in the course of six or eight days, and packed up for sale. For the particulars of this unexpired patent, the inquisitive reader will consult the 10th vol. of the *Repertory*, &c. where the process is duly specified.

LAMPAS, in FARRIERY, denotes an excrescence in the roof of a horse's mouth, which is sometimes so luxuriant that it grows above the teeth, and thus prevents his feeding.

This malady may be cured by cauterizing the flesh with a hot iron; an operation which should be carefully performed by a skilful Veterinary Surgeon, lest the swelled part be penetrated so deep, as to scale off the thin bone that lies under the upper bars: after having thus extirpated the tumor, it will be necessary to anoint the sore parts with burnt alum and honey, which form a very proper application to an ulcerated mouth in general.

LAMPREY, or *Petromyzon*, L. a genus of fish comprising three species, which are chiefly distinguished by their peculiar back fins.

1. The *marinus*, or SEA LAMPREY, which, in shape, resembles an eel, has small eyes, covered with a light blue membrane, and the pupil is encompassed with a gold-coloured ring. During cold weather, this fish conceals itself in the crevices of rocks; on the pebbly edges of which it is an usual expedient among anglers, to form pits extending to the water-side; into these a little blood is thrown, to induce the lamprey to put forth its head between two rocks. As soon as the hook, which is to be baited with crab, or some other fish, is presented, it is greedily swallowed, and thus the prey is easily taken.

2. The *fluviatilis*, or LESSER LAMPREY; the mouth of which is like that of the preceding, but the colour of its back is either brown

or dusky, sometimes mixed with blue, the whole underside being silvery.

These fish sometimes grow to the length of ten inches, are found in the rivers Thames, Severn, and Dee; are potted with the larger kind, and occasionally preferred, on account of their milder flavour.—Vast quantities are taken about Mortlake, and sold to the Dutch, who employ them as bait for their cod fishery. It is computed that above 430,000 have in one season been vended to them at 40s. per thousand; as they possess the secret of preserving the lamprey till the turbot fishery commences.

3. The *branchialis*, or LAMPERN, which is found in the Isis, near Oxford, and other British rivers; it is about eight inches long, and the body does not exceed the thickness of a swan's quill.—Unlike the other species, lamperns conceal themselves in the mud, and never adhere to stones, or other matters.

The flesh of these fish, in general, is white, fat, soft, and easy of digestion: it has an agreeable taste, and is not less nutritive, though more wholesome, than that of the eel: those of a large size, however, possess a superior flavour.

LAND, in general, signifies any kind of ground, but is particularly applied to such as is ploughed, or tilled for agricultural purposes.

As we treat, in alphabetical order, of the different methods of cultivating the earth, we shall at present confine our attention to the proper modes in which waste, or other soils, may be most advantageously converted from a natural and unproductive, into an artificial state.

The best method of meliorating *swampy ground*, after it has been properly drained, is to pare and burn it. Where the earth, however, is dry, and the soil or mould so thin that it will not admit of paring the surface, the most effectual mode of bringing it into tilth, will be to plough it well, and turn the grass-sods inward. As soon as the new surface is mellowed with frost, the field should be harrowed, in order to fill up all the seams: thus, the air will be excluded, and the sod become perfectly rotten. In this state, it ought to lie during summer, and the succeeding winter; but early in the following May, it will be requisite to *cross-plough* the whole, after which the earth must be well pulverized with a brake-harrow, and thus prepared for a future crop.

Old heath-lands may be advantageously reclaimed from their barren condition, by first passing a drill roller over them; after which they should be sown with oats and grass-seeds at the same time. When the harvest is finished, the soil is directed to be *fed hard* with sheep, for two years; then repeatedly ploughed and harrowed, so as to render it fit for the reception of cole-seed: this vegetable is likewise to be *fed off* with sheep, and the soil worked in a similar manner for rye, together with which grain, seeds are again to be sown. Such crop should now be suffered to remain as a layer, till it can be well manured with marl, in the proportion of about sixty loads per acre; after which it may be brought into a regular course of tillage. By this method, the whole *flag* will have sufficient time to putrefy, and the soil will not be easily exhausted, as is frequently practised with *new* lands.

Ground, thus managed, has been found to be well calculated for *buck-wheat*;—the expence of manuring it with clay, or marl, varies from 2l. to 4l. per acre, according to the distance at which those substances are carried from the pits.

In the 13th vol. of the *Transactions of the Society for the Encouragement of Arts*, &c. Mr. Rich. Ramsden Bramley communicates the most beneficial method of cultivating meadow or pasture land, that is over-run with coarse grasses, or which is either naturally, or has from neglect become, rough and uneven.—The first process he states to be paring, after which a small trench should be dug, in which a row of potatoe-sets may be planted, and slightly covered with the sods, serving as a nourishment to the rising crop, while they greatly contribute to form a light soil.

The ground is next to be completely cleaned by ploughing, harrowing, &c.; then sown either with oats or barley in the ensuing spring; after which sixteen bushels of hay, and ten pounds of clover-seeds per acre, should be uniformly scattered, and harrowed in. Thus, the soil will be rendered very fertile for the culture of corn, or other grain; and Mr. Bramley adds, that the paring and digging (which cost upon an average about 3l. 12s. per acre) afford so decided an advantage to the crop, as amply to compensate for the additional expence: besides, the land will afterwards be ready for cabbages, carrots, or onions, in case such crops should be wanted; and, if there be any inequalities in the ground, they will, by this management, be speedily remedied.

For the most effectual method of breaking up and meliorating marshy, or moorish soils, the reader will consult the articles Marsh and Moor.

In the year 1799, a patent was granted to a Mr. Hayes, for his invention of various machines or implements for agricultural purposes, upon a new construction. These are applicable to the tillage and culture of *every kind of soil*; but, as they are too numerous to be detailed here, and as the manufacture of them is confined to the patentee, we purposely omit their specification, and refer the inquisitive reader to the 12th vol. of the *Repertory of Arts*, &c. where the various articles are minutely described, and illustrated by an engraving.

LAND-DITCHING, or Hollow-draining, is practised chiefly in the counties of Essex and Hertford. It consists in digging both main and side-drains, similar to those generally adopted in draining land: the former are usually made from 22 to 24 inches, the latter from 20 to 22 inches, in depth. The soil is previously ploughed; and the length to which the main drains may be protracted, without a vent, depends upon the situation of the land: when it has a regular declivity, the most proper method will be to carry off as much water as possible, by means of side-drains; but, if the ground be irregular, it will be requisite to form additional main-drains, so that every advantage may be derived from the vallies, into which the latter must often be conducted to a considerable extent.

The length of the side-drains varies according to the elevation of the soil: in general, they need not be more than one rod apart from each other; though, in very loose or porous grounds, they may be dug at a distance of one rod and a half. When the trenches are cut to a sufficient depth, they are filled up, and covered in the usual manner with straw and bushes. The expence of this method of draining is computed to be nearly 3l. per acre.

Land-ditching not only carries off the water from wet or marshy soils, but also meliorates stiff loamy clays; which, being thus better enabled to resist the long-continuance of moisture on their surface during the winter, promote vegetation very early in the spring, and the grass is rendered of a superior quality. The weeds, &c. change their colour, and are totally divested of their rankness: the corn also increases both in quantity and weight.—Another important advantage arising from this practice, is, that it will admit of the soil being ploughed at an earlier period of the spring, and later in autumn; while it may be tilled with greater facility, and kept clear from weeds at a very small expence.

LANG-DE-BŒUF. See OX-TONGUE.

LANGUAGE, signifies the expression of our ideas, and their different relations, by means of articulate sounds.

The acquisition of languages is an object of great importance. Without entering into a discussion concerning their origin, we shall briefly observe, that the power of speech is not naturally acquired; because, when considering its mechanism, certain positions and motions of the organs of the mouth, such as the tongue, the teeth, lips, and palate, &c. are necessary for uttering sounds, which cannot be imitated by persons living in a state of Nature, and must, therefore, be the effect of *art*. Hence civil society alone could produce a language; and, as the former is not from Nature, or coeval with the animal, it follows that both must have had a beginning.

The same cause that first produced ideas, and made men rational creatures, also rendered them social or political, and in process of time produced all the arts of life: this cause, in the opinion of the late Lord MONBODDO, is no other than the *necessities* of human life. These are either the want of subsistence, or of defence against superior force and violence; so that, without the operation of one or other of these causes, there never would have been society, language, or arts, among men.

The most easy and correct method of acquiring languages, is, however, of greater consequence than the history of their origin. Singular as this assertion may appear to many of our readers, it is nevertheless true, that a just model, or plan of teaching, so useful an art as that of speech, to children or adults, has long been, and still remains, a great *desideratum*. And though we are not in possession of a *perfect* system of grammar, yet many excellent treatises have been written on that subject by ingenious men, who have, *individually*, contributed to render the art of speaking and writing more familiar to persons of ordinary conception. Unfortunately, however, less attention has, in general, been paid to the acquisition of modern languages, than to those of the ancients. Hence we may confidently recommend the method pursued by Dr. EGAN of Greenwich, on whom the Society for the Encouragement of Arts, &c. in 1787, conferred a gold medal, for teaching youth to write and speak Latin in common conversation, both fluently and correctly. His plan is, to divest instruction of that harshness, which intimidates juvenile minds, and retards their progress in learning. And he has succeeded in rendering the hours of amusement subservient to the promotion of the classical part of education, by inducing his pupils to speak Latin with equal ease and precision. To effect this purpose, he prohibits boys of a certain standing, from practising any language except the Latin or French; and a mark is circulated, for the prevention of solecisms and barbarous expressions. If a pupil, who has this mark, hear another speak ungrammatically, it is passed to the latter, and he who receives such mark most frequently in the course of the day, incurs a small fine. To avoid this penalty, Dr. E.'s scholars pay the strictest attention to the choice and arrangement of their words, the construction of their sentences, as well as the style, purity, and harmony of their diction.

Thus a considerable portion of time and expence is saved; independently of the numerous other beneficial consequences that result from this plan, as it may be easily applied to the different *living* languages. Hence it well deserves to be more generally known, and adopted in those schools where years are wasted by the old method, which is comparatively absurd.

The English language undoubtedly possesses a superior degree of excellence, blended with a greater number of defects, than that of every other nation in Europe. Bold and energetic, it is admirably calculated alike for history and the drama: at the same time, from its smoothness and copiousness, it is peculiarly adapted for the different branches of poetry. But, with all these advantages, it labours under an infinity of monosyllables, which will ever prevent it from attaining that swelling fulness of sound, which so essentially contributes to produce both harmonious dignity and graceful cadences in literary composition. To this imperfection must be added the letter s, which, by its very frequent and inevitable recurrence, communicates to the whole such a general *hiss*, as cannot fail to be unpleasant to every impartial person, who has the least conception of musical harmony. We have neither room, nor an opportunity of pointing out a remedy for this harshness; yet, if the syllable *en*, which was formerly appended to the plural number, were restored to its ancient place, we presume that many of the difficulties would be removed; and that, trifling as this alteration may appear, the language would thus be greatly improved.

LANTHORN, or LANTERN, a well-known contrivance, which serves to carry a candle, without exposing it to the air, or otherwise incurring danger.

Lanthorns are usually made of glass, horn, or other transparent matter, for the transmission of light; but, if they were covered externally with thin wire-work, many accidents might be prevented in stables and barns, as the lanthorns might thus be rendered less liable to injury from external accidents, while the communication of light would not be materially impeded.

LAPWING, or *Tringa Vanel-*

lus, L. a British bird, distinguished by its black bill, crown of the head, crest, and throat; red legs, black and white wings and tail: it is above 12 inches in length, and weighs about eight ounces.

The female of this bird constructs her nest with a few bents, and deposits four eggs of an olive shade, spotted with black: these are, on account of their delicacy, much esteemed, and sold by the London poulterers for three shillings and upwards the dozen.

During winter, lapwings frequent fens and marshy places, where they join in numerous flocks; and, though remarkably shy, are then easily taken in nets similar to those employed for catching ruffs. They are not preserved for fattening, but killed when caught: their flesh is very palatable and nutritious.

LARCH-TREE, or *Pinus Larix*, L. one of the most valuable exotics, which was introduced into Britain from the Alps towards the end of the 17th century, and has been lately cultivated with particular attention.

The larch will grow in any soil, but it flourishes most luxuriantly on cold and gravelly lands, or such as are neither too stiff nor too dry; provided its roots can penetrate through the soil to a sufficient depth. It is propagated from seeds first put in a light earth; and, at the end of two years, the young plants are usually removed to those spots where they are destined to remain. This useful tree should be transplanted immediately after shedding its leaves: during the first four years, it grows slowly, and seldom exceeds three feet in height; but in the course of 20, it will surpass both in length and girth, a fir-tree 40 years old; at the age of 24, it is, in general, from 50 to 60 feet high; and, in 50 or 60 years, it often attains the height of 120.

The most proper season for felling the larch, is in the month of July; because the liquid which oozes from the tree at that time, is speedily changed into a gummy-resinous matter, so that the wood is not drained so much as at other seasons, but hardens, and may thus be sooner employed.

The larch is of singular utility for various purposes, in which durability and strength are required. Hence it is peculiarly calculated for ship-masts and the building of vessels, or for strengthening the wooden frame-work of bridges; for it is capable of supporting a much greater weight than the oak itself, and almost petrifies under water. It also resists the intemperature of our climate, and is of excellent service for gates, pales, and other works which are exposed to all the vicissitudes of the weather.

Larch timber is equally durable within doors; and houses constructed with it, have a whitish cast for the first two or three years; after which the outside becomes black, while all the joints and crevices are firmly closed with the resin extracted from the pores of the wood by the heat of the sun; and which, being hardened by the air, forms a kind of bright varnish, that has an elegant appearance.—Nor is there any wood which affords such durable pipe-staves for casks, while the flavour of the wine is at the same time preserved and improved.—Its trunk, when perforated and *tapped* between the months of March and September, yields the purest *Venetian*

tian turpentine, that is of considerable use in medicine. Its large branches produce small sweetish grains, resembling sugar; and which are known under the name of *manna*, from their possessing similar purgative properties with that drug.

The larch is likewise an excellent nurse to the more tender trees; as it is furnished with several small, pliant branches abounding with leaves; which, from their flexibility, readily yield to the contiguous trees, admit rain more easily than Scotch firs, and receive no injury from inclement snowy winters; when the branches of the latter are frequently stunted, and the trees themselves totally destroyed.

Beside the manifold uses to which this inestimable tree is subservient, we shall mention a few additional facts, chiefly extracted from foreign writers, with the confident hope of promoting its more general culture.—From the inner rind or bark of the larch, the Russians manufacture fine white *gloves*, not inferior to those made of the most delicate *chamois*, while they are stronger, cooler, and more pleasant for wearing in the summer.—A gummy matter, partaking of the properties of animal glue, and vegetable mucilage, is obtained by a curious process from the sap of this tree; and which greatly resembles the gum arabic or Senegal, though it is of a brown colour; it is known in Russia by the name of *Orenberg Gum*. PALLAS informs us, that the untutored natives cut a hole at one side of the trunk, near its root, then burn the wood to the very pith, by applying combustible materials: in consequence of the heat thus generated, the circulating medullary juice descends in drops, which concrete into a transparent gum, forming various fanciful configurations.—In countries where the larch-tree abounds, its firm and compact wood (a cubic foot of which, or 144 solid inches, weighs 41 pounds, and exceeds that of the fir in the proportion of 8 to 7), affords a very superior charcoal: this, likewise, in quantity, measured one-third more than that burnt from the fir-tree; and its specific gravity, on weighing and balancing it with the latter, was as 8 to 5. It is, however, remarkable, that the larch contains more aqueous ingredients than the fir-tree, insomuch that five measures of the oily water collected during the combustion of the former, yielded, on evaporation, only 3½ ounces of pitch; whereas four and a half measures of the latter, produced 4 ounces.—Buildings erected of larch wood, have been observed to remain sound for 200 years; as it is eminently adapted to resist the effects of air and water, while it is exempt from the depredations of the worm: hence it is peculiarly excellent for shingles; but, on account of its combustible nature, it would be advisable to prepare them in the manner directed by Mr. KNOX, vol. ii. p. 283, and foll.—Lastly, the bark and other parts of this profitable tree, have been found, by experiment, to be proper substitutes for that of the oak.

LARK, or *Alauda*, L. a genus of birds comprising twenty-eight species, of which the most remarkable are:

1. The *arvensis*, or COMMON SKY-LARK; a long-lived, and hardy bird, mounting high, raising its notes as it soars, and lowering them as it descends. It is remarkable,

that this, and the following species, are the only known creatures that sing during their flight.—The female sky-lark constructs her nest in fields productive of high grass, or in marshes, on the ground, beneath some clod; forming it of hay, dry fibres, &c.: she deposits four or five eggs, and produces young ones three, and often four times in a year.—In the neighbourhood of Dunstable, these birds are taken in great numbers, from the 14th of September to the 25th of February; during which time about 4000 dozens are caught, to supply the markets of the metropolis.

2. The *arborea*, or WOOD-LARK, is distinguished by an annular white fillet about the head. It is of inferior size, and its notes are weaker and less musical. This little warbler, when in the cage, often strives to excel the nightingale; and, if not speedily removed from the place where he is suspended, will certainly fall a victim to emulation.

Wood-larks perch on trees, and their whistle resembles that of a black-bird; the female builds her nest on the ground, and furnishes it externally with moss, but internally with dried bent-grass, &c. She lays five eggs, of a dusky colour, interspersed with deep brown spots. The common food of young larks reared in an aviary, is a hen's egg boiled hard, and chopped or grated very fine, together with the crumb of bread, and hemp-seed; but, if diseased, a few wood-lice may be given them: a little liquorice, and a blade of saffron, may also be infused in their water, which will contribute to their speedy recovery.

Method of catching Larks:—The usual practice of taking these birds is, by *trammels*, or a kind of nets, generally 36 yards in length, and about 6 yards in breadth, having six ribs of pack-thread, which are fastened on two poles, about sixteen feet long. After selecting the darkest night for this sport, the net is to be drawn over the ground by two men, who frequently drop it, lest they should pass over the birds; as soon as the latter are perceived to fly up against the trammel, it is instantly clapped down, and thus the larks are secured.—This net is also well calculated for catching various other kinds of birds, such as partridges, quails, woodcocks, &c.

LARK-SPUR, or *Delphinium*, L. a genus of plants, consisting of 14 species, one of which only is indigenous; namely, the *consolida*, or Wild Lark-spur; Field Lark-spur, or Lark's-heel: it grows in corn-fields, and flowers from the month of June to September.

The expressed juice of the petals of this plant imparts a green colour; and, with the addition of a little alum, will produce a good blue ink.—The seeds are acrid and poisonous.—Sheep and goats eat the lark-spur; horses do not relish it; while cows and swine totally refuse it.—Bees are remarkably attached to its flowers, which are likewise gathered by the country-people of Germany, cut small, and mixed with tobacco; as they are said to improve its flavour.

LASSITUDE. See DEBILITY.

LATH, in building, a long, thin, narrow slip of wood, which is nailed on the rafters of a roof, in order to support its covering.

Laths are divided into three classes, according as they consist of different kinds of wood: viz. 1. Such as are formed of *heart of oak*, and which are used only for tiling; 2. *Sap*; and 3. *Deal-laths*;

both of which are employed exclusively for ceiling and making partitions. They are farther distinguished, with respect to their length, into *five-feet*, *four-feet*, and *three-feet* laths, though the statute allows only laths of two lengths, namely, those of five, and three-feet: each of these is directed to be an inch and a half in breadth, and half an inch in thickness.—For an excellent method of laying laths, so as to make them *fire-proof*, the reader will consult p. 281 of our 2d volume.

Laths are sold by the bundle, which is generally called a *hundred*; it should be observed, however, that seven score, or 140, are computed in the hundred for three-feet laths; six score, or 120, in such as are four feet in length; and for those which are denominated five-feet, a full hundred, or fivescore.

LATH-BRICKS are a particular kind of that article, made in the county of Stafford, and other parts of Britain: they are 22 inches in length, and 6 inches in breadth, being used as a substitute for laths or spars, and supported by pillars in *casts*, for the drying of malt.—This excellent contrivance deserves to be more generally known; for, independently of the security which lath-bricks afford against fire, they retain heat much longer than wooden-laths; and, after having been once thoroughly warmed, they require a very moderate fire, to preserve the proper temperature.

LATHE, a very useful engine for turning wood, ivory, metals, and other hard substances.

The invention of this instrument is of great antiquity, for, according to VIRGIL, the ancients availed themselves of it, in forming various kinds of vases, which they enriched with figures and ornaments in basso-relievo.—It is composed of two wooden cheeks or sides, parallel to the horizon, with a groove between them: perpendicular to these are two other pieces, called *puppets*, constructed so as to slide between the cheeks, having two points meeting the opposite central sides or ends of the article intended to be worked, so as to sustain it: thus, the piece is turned round in both directions, by means of a cord attached to it, fastened above to the end of a pliable pole, and underneath to a treadle or board, which is moved by the foot. To such apparatus, a *rest* is also subjoined, which supports the instrument, and keeps it steady.—This useful machine has lately been much improved, and we had an opportunity of comparing a variety of *lathes* manufactured of steel in the metropolis, and designed chiefly for private use and exercise; among which, for neatness and simplicity, we are inclined to give the preference to those contrived by Mr. HOLTZAPFEL, an ingenious young artist, of Long-acre.

With respect to the manner of applying this curious instrument to the various purposes to which it is adapted, we refer the reader to the article TURNING.

LATTIN, or Latten. See Block TIN.

LAUDANUM. See OPIUM.

LAVENDER, or *Lavandula*, L. an exotic genus of plants, comprising seven species; the principal of which is the *spica*, Lavender-spike, or Common Lavender: it flowers in the month of July.

This herb may be easily propagated: in March or April, take a quantity of slips, or cuttings, from three to four inches long; having stripped off the lower leaves, plant them in a shady border, four inches apart. If occasionally watered in dry weather, they may be transplanted early in autumn; removing them, if possible, with balls of earth.—When they are intended for a crop, it will be requisite to set them in rows two or three feet separate, and at the distance of two feet from each other; but, if destined for the shrubbery, they should be planted singly, at proper distances.

Lavender is employed both for medicinal and domestic purposes. The flowers should be gathered in July, when the spikes being cut off close to the stem, in a dry day, and tied up in bundles, are much esteemed, not only for their grateful odour, when deposited in chests, or boxes, among linen; but chiefly for preventing the depredations of *moths* and other insects.—By distilling these flowers, they yield a compound spirit, which is of considerable service in palsies, vertigoes, lethargies, tremors, &c. The distilled oil possesses the power of destroying the *pediculi inguinales*, and other cutaneous vermin. If soft, spongy paper be dipped in this oil, and applied at night to the parts infested with the insects, they will, according to GEOFFROY, be found dead in the morning.

LAVENDER-THRIFT, or SEA LAVENDER, *Statice Limonium*, L. an indigenous perennial plant, growing on the sea-shore; in salt-marshes; and the fissures or clefts of rocks, near the sea-coast: it is in flower from July to September.

This vegetable deserves the attention of *tanners*, on account of its red, astringent root, called, by the Russians, *Kermek*; and from which they prepare that valuable kind of leather distinguished by its peculiarly strong, though not ungrateful odour, and on the Continent termed *Juften*.—GULDENSTAEDT, in his *Travels through Russia*, observes, that on the coast near Azof, he met with a tan-work in which the root of the Sea-Lavender was employed in dressing the hides of oxen, both for the celebrated Russia, and common sole-leather. The roots are previously dried in the sun, and finely pulverized: next, the hides are cleaned with ashes obtained from the roots of the oak, and suffered to lie a month in this preparatory lixivium; after which they are immersed into the liquor made of the pounded roots before mentioned. He adds, that there is not the least doubt of this root proving a complete substitute for the more expensive oak-bark.

LAUGHTER, a sudden and convulsive expression of mirth, peculiar to the countenance of man; and which is occasioned by some object that surprizes the fancy.

This emotion, however, more frequently arises from an unexpected disappointment of the mind, while its attention is arrested by an object apparently of great importance; but suddenly terminating in ridicule, or insignificance.—With respect to its influence on the body, moderate laughter is very beneficial; for it contributes to promote the circulation of the blood through the lungs, and has frequently removed colics, pains in the stomach, and similar complaints. Various instances have likewise occurred, in which deep-seated ulcers of the lungs and liver, that could not be relieved by any remedies, bursted, and were perfectly cured by a fit of laughter, artificially excited. Beside the pleasing sensations with which it is accompanied, this affection powerfully operates on the organs of digestion, and greatly contributes to the assimilation of food.

LAUREL. See BAY-TREE.

LAXATIVES, or APERIENT MEDICINES, are such as promote a loose state or disposition of the bowels, for the more easy and regular evacuation of the feces. On account of the gradual effect which *laxatives* produce on the body, they are distinguished from the more powerful or drastic purges, which operate more speedily. Hence, with the former intention, castor-oil, or cold-drawn linseed-oil, are alike calculated to afford relief, especially if they be taken in small doses, such as a table-spoonful every hour, with a draught of warm ale, till they mildly operate.—As, however, the difference between these, and the more brisk cathartics, greatly depends on the manner of administering them, we shall communicate a few observations on both, under the article, PURGATIVES.

LAYERS, in horticulture, denote certain tender shoots or sprigs of trees, which are buried or deposited in the ground, till they have taken root; when they are separated from the parent stock, and become distinct plants.

The method of propagating trees by layers, is performed in the following manner: A small cut or slit is first to be made in the branches, which should then be *laid* about half a foot deep, in light, rich mould, and gently watered; but, if they do not retain the position in which they were placed, it will be necessary to fasten them down with wooden hooks.

The best season for propagating layers is, for evergreens, towards the end of August; and for deciduous trees, in the beginning of February: after having taken root, they may be separated from the parent stock, and planted out in the succeeding winter. Some horticulturists, however, recommend stripping off the rind or bark; others direct the branch to be twisted, previously to setting it in the ground; but these operations are not essentially requisite, as the layers will flourish, if proper attention be paid, to water them regularly during their early growth.

LAZARETTO, or LAZAR-HOUSE, signifies a public building similar to a hospital; and which is intended for the reception of those who are infected with contagious distempers. It is also more particularly applied to edifices appropriated solely to the purpose of detaining and purifying such persons as arrive from places or countries, which are apprehended to be infected with the plague.

There are several institutions of this nature in the Italian and other ports, connected with the Levant; but *quarantine* is, in general, so negligently performed, that the merchandize often arrives at the place of its destination, in the same state in which it was embarked. Such abuse loudly calls for legislative interference; and it is devoutly to be wished that a lazaretto were established in every sea-port town of the United Kingdom, where vessels returning from the Mediterranean discharge their different cargoes.—In the mean time, we seriously recommend the following simple expedient to all country manufacturers; namely, that they should always station themselves and their workmen to the windward, when they open bales of Turkey cotton, which have not been unpacked since they were shipped, perhaps during the prevalence of the plague. This easy kind of attention will not occasion great loss of time, or any additional expence; while it doubtless tends to avert impending, though distant danger, and to prevent the introduction of that dreadful scourge, the plague.

LEA, a measure used in some parts of England, to express a certain quantity of yarn.—The statute 22 CAR. II. directs a *lea of yarn*, at Kidderminster, to contain two hundred threads, on reels that are four yards in circumference.

LEAD, one of the imperfect metals, is of a dull white, inclining to a blue colour; and, though the least ductile and sonorous, it is the heaviest of metallic bodies, excepting mercury, gold, and platina.

Lead is found in various countries; but it abounds in England, especially in the counties of Derby and Devon. When dug out of the earth, it is crushed in a mill, and smelted in a manner similar to iron-ore, of which we have already treated.

A patent was granted in 1779, to Mr. W. ROE, for his new-invented process of extracting *sulphur* from poor lead ores, and rendering these as valuable, and saleable, as any other ores of this metal.—As this patent is now expired, and the principle of the inventor is equally simple and ingenious, we trust it is, or will be, generally adopted in our smelting-houses: the inquisitive reader will find it fully specified in the 6th vol. of the "*Repertory of Arts and Manufactures*."

Lead is employed in making various vessels, such as cisterns for water, large boilers for chemical purposes, &c. Considerable quantities are likewise used in the casting of shot, for which a patent was granted in 1782, to Mr. WILLIAM WATTS, in consequence of his invention of granulating lead solid throughout, without those imperfections which other kinds of shot usually present on their surface.—The patentee directs 20 cwt. of soft *pig-lead* to be melted in an iron pot, round the edge of which, a peck of coal-ashes is to be strewed upon the surface of the metal, so as to leave the middle of the latter exposed. Forty pounds of *arsenic* are next to be added to the uncovered lead, and the pot closely shut; the edges of the lid being carefully luted with mortar, clay, or other cement, in order to prevent the evaporation of the arsenic. A brisk fire is then kindled, so that the two substances may be properly incorporated; when the metal ought to be skimmed and laded into moulds, that it may cool in the form of ingots or bars, which, when cold, are called *slag*, or poisoned metal.—20 cwt. of soft pig-lead (according to the quantity of shot intended to be manufactured) are next to be melted in the manner above directed; and, when it is completely liquefied, one of the ingots or bars of slag must be added: as soon as the whole is combined, a small quantity of the liquid metal is to be taken out with a ladle, and dropped from a height of about two feet into the water. If the shot be not perfectly round, it will be necessary to add more slag, till it drops in a globular form. The metal is next skimmed, and the scum poured into an iron or copper frame perforated with round holes, according to the size of the shot designed; the scum is then to be squeezed while soft, through the frame, into which the liquid should be poured, and dropped through the holes. For the smallest shot, the frame must be at least ten feet above the water, and for the largest, about 150 feet; the height being increased or diminished, in proportion to the size of the shot.

There are various other purposes to which lead is usefully applied: it unites with almost every metal, except iron; but, if both metals be exposed to the fire in a proper vessel, the former scorifies the latter, and melts with the calx into a dark coloured glass. On account of this property of vitrifying the imperfect metals, lead is often used in the purification of gold and silver, neither of which combine with it, but remain pure on the bottom of the cupel.—It is also frequently employed by unprincipled dealers, for correcting the rancidity of damaged rape-seed oils, and those of almonds or olives. This dangerous abuse may be discovered, by mixing a small quantity of the suspected oil with a solution of orpiment, or liver of sulphur, in lime-water: as, on shaking the two liquids together, and suffering them to subside, the oil will, if it be adulterated with lead, acquire an orange-red colour; but, if it be pure, it will assume only a pale yellowish shade. A similar pernicious fraud is practised with acid wines, which dissolve a sufficient portion of lead, so as to acquire a sweetish taste: this may be detected by means of the same solution, which forms the chief ingredient of the different liquid tests sold for that purpose.

Lead, when taken or inhaled into the human body, is productive of various fatal disorders, to which miners, potters, and all other persons concerned in its manufacture, are peculiarly subject. Hence culinary vessels, or other domestic utensils made of this metal, are highly objectionable, especially if they are intended to contain cyder or other acid liquor. To this cause the *Devonshire colic* is justly attributed; for great quantities of cyder are, in that county, kept in vessels, consisting either wholly of lead, or such as are soldered with this pernicious metal. The *dry belly-ach* of the West Indies is of the same origin, and is occasioned by distilling rum through leaden worms.

In these dreadful complaints, the patient is seized with an acute spasmodic pain in the stomach, which extends gradually to the whole intestinal canal: the bowels are frequently inverted and drawn towards the spine, so as to render the application of clysters impracticable. At the same time, a most obstinate costiveness prevails; and the affection at length terminates in palsy, or in fixed contractions of the limbs.

For the cure of this painful malady, gentle clysters and laxatives may at first be administered; but, if these are not attended with beneficial consequences, Dr. PERCIVAL decidedly recommends the internal use of *alum*; which, in slight cases of the Devonshire colic, has generally effected a cure, when used to the extent of 15 or 20 grains every fourth, fifth, or sixth hour. Balsam of Peru, in doses of 40 drops, to be taken two or three times in the course of the day, has also been advantageously prescribed;

at the same time, castor-oil, or other mild laxatives, conjoined with gentle opiates, have greatly contributed to afford relief.—The patient's diet ought to consist of nourishing broths, panada, and gruel, or similar light dishes.

In whatever form lead may be introduced into the human body, it is equally deleterious and fatal, whether its vapours be inhaled through the lungs, absorbed through the pores of the skin, or particles of the metal be taken into the stomach. The only effectual antidotes to this insidious poison are, antimonial emetics; and, after them, the internal use of liver of sulphur, together with vegetable oils, both externally and internally, should be liberally continued.

Red-lead, or *Minium*, is a calx of lead of a lively red colour, which it acquires by slow calcination and reverberation.—Its preparation is as follows: A quantity of lead is first burnt in a furnace, till it is converted into a kind of litharge, being stirred continually with an iron spatula, while it is melting: it is then ground in a mill to a fine powder, after which it is again put into the furnace and stirred as before, when it assumes first a blackish hue, then a yellow cast, and at length becomes of a deep red colour. While this operation is performing, the greatest caution is requisite to keep the fire at a certain height, in order to prevent the matter from adhering, and running together.

The bright colour of minium would render it a valuable pigment, if it could *stand* either in oil or in water: but, being apt to become black, it is seldom employed, except as a ground for vermilion.—The genuine quality of red-lead may be ascertained by the brightness of its colour; and, as it is frequently adulterated, such fraud may be easily detected, by mixing equal quantities of minium and charcoal-dust in a crucible, and placing the whole over a fire sufficiently intense to melt lead. When it has continued for some time over the flame, it must be removed; and, when cold, stricken against the ground. Thus, the red-lead will be reduced to its metallic state; and, when freed from the charcoal, its diminished weight will shew the proportion of adulterated matter.

In medicine, red-lead is only employed externally: it obtunds the acrimony of humours; mitigates inflammations; and, if judiciously applied, is of excellent service in cleansing and healing old ulcers.

White-Lead, or *Cerussa*, is prepared by placing a vessel containing vinegar in a moderately warm place, and over which thin plates of lead are suspended, so that the vapour arising from the acid may circulate freely round the plates. A white powder settles in the course of two or three weeks, on the surface of the metal, which is now removed into another room, and passed beneath a screen, and pair of rollers, for separating the corroded from the sound part; that is again suspended, till it is wholly converted into a white calx; when it is called cerusse, or white-lead. During this operation, a considerable portion of fine dusty particles settles on the skin and lungs of the workmen, to whom it is attended with the most pernicious consequences. In order to counteract such injurious effects, Mr. Ward, in the year 1795, laid a machine before the Society for the Encouragement of Arts, &c. and was consequently rewarded with their gold medal. It consists of a vessel 12 feet in length, six feet wide, and three feet ten inches deep, in which a pair of brass rollers is fixed, one above the other: the centre of these is about ten inches beneath the top of the vessel; and, one inch lower, a covering of oak-boards or *riddles*, about an inch thick, is inserted in a groove on the inside of the vessel, so that it may be occasionally removed. These boards are perforated in the centre with several holes, each of which is about five-eighths of an inch in diameter.

Previously to the working of this machine, the vessel is filled with water, about three inches above the oak-boards; when the whole of the lower brass-roller, and half the upper roller, are completely immersed: the lead, on being corroded, is passed through these cylinders; and, by stirring the metal with a copper rake, the cerusse is forced through the riddles, and the blue or uncalcined metal remains above. Thus, white-lead is prepared; and, by such useful contrivance, the minutest particles are prevented from ascending, and consequently their pernicious influence on the health of the workmen is effectually obviated.

Among the different patents registered for the manufacture of white-lead, we shall mention only those granted to Mr. JAMES TURNER, in 1780; to Mr. RICHARD FISHWICK, in 1787; and to the Earl of DUNDONALD; of which the reader will find ample specifications in the different volumes of the "*Repertory*," &c.—A patent was also granted in 1799, to Mr. JOHN WILKINSON, for a new method of making white-lead: he directs any quantity of litharge to be ground very fine in sea-water, or other saline mixture; and, by repeatedly triturating, washing, and bleaching it, the patentee asserts, that white-lead of the best quality may be obtained. No vinegar, or other acid mixture, is necessary in this process; as levigation, repeated ablutions, and drying, are amply sufficient, provided more time be allowed for the operation, by the medium of the common atmosphere.

The last patent we shall notice, was obtained at the commencement of 1801, by Mr. THOMAS GRACE, for a contrivance of making an acid to corrode lead, and also for a new process of manufacturing white-lead.—In either respect, however, the usual method is but little varied: the acid required for the purpose is generally prepared by fermenting melasses and water, together with other materials, which are well known to vinegar-makers, and which it would be needless to detail. Among other articles, he makes economical use of the *sours*, or water in which wheat has been steeped for converting it into starch; as likewise of the water employed for distilling oil of turpentine; both these liquids possess a considerable portion of acidity, which has hitherto been generally wasted.

All the different methods of preparing white-lead, however, are extremely pernicious, as well to the manufacturer as to those who use vessels that are glazed with it. Hence we have already (vol. ii. p. 377) pointed out proper substitutes for this destructive metal, which were invented by foreign chemists; and shall, therefore, conclude with an account of the patent granted in 1796 to Mr. JAMES

Keeling, for his contrivance of a substitute, both for red and white-lead, in glazing earthen-wares, glass, enamel, &c. He directs any quantity of lead-ore, to be put into a reverberatory or other furnace, and to be roasted till it become of a *white-heat,* during which process the metal will emit a considerable portion of fumes. The fire must be continued till about an hour after the vapour is dissipated; and, when the mass grows cool, it is to be removed from the furnace, and ground with water to a fine liquid state, when the other ingredients, usually employed in making *glazes,* may be added; and the preparation will be complete. Thus the injuries occasioned to the workmen, by the dusty particles which settle upon their skin and lungs, will be effectually prevented; but this *succedaneum* does not remove the poisonous qualities of the metal in the glazing of earthen-ware.

White-lead is employed in painting, and furnishes a tolerable white. —See vol. ii. p. 36; and also Paint.

Cerusse is likewise used in surgery; and, on account of its cooling, drying, and astringent properties, is of considerable service when sprinkled over running sores or ulcers.

Black-Lead, or *Plumbago,* a genus of inflammable substances, found in various parts of the world; but most abundantly at Borrowdale, in Cumberland; whence Britain, as well as the greater part of Europe, are supplied with this article.

Pure black-lead is of a very deep colour: when newly cut, it presents a blueish-white cast, and shines like common lead. It is insoluble in acids; but, if it be put into a vessel placed over a strong fire, and exposed at the same time to the air, it is almost entirely volatilized, depositing only a little iron, and a small portion of siliceous earth.

Black-lead is chiefly used in the manufacture of pencils for drawing; and though paper can be marked with them for a time, yet every trace may afterwards be totally rubbed out by means of soft bread, or elastic gum. In forming such pencils, the lead is divided into long pieces, and fixed into square grooves, cut in cedar or other soft wood: another piece is then glued over, and the whole worked into thin cylinders. A coarser kind of pencils is manufactured, by mixing pulverized black-lead with sulphur; which, however, are calculated only for carpenters' marks, or very coarse drawings.—The powder of black-lead also serves to cover razor-straps; and considerable quantities of it are used for imparting a bright gloss to cast-iron grates or stoves.—It may also be advantageously applied to smoothen the inner surface of wooden-screws, packing-presses, and other wood-work that is subject to frequent friction, for which purpose it is far superior to greasy, soapy, or oily matters.

LEAD-WORT, or *Plumbago,* L. a genus of exotic plants, consisting of four species; the most remarkable of which is the *Europaea:* its root is perennial, strikes deep into the ground, and grows naturally in the southern parts of Europe.

This very acrid and poisonous vegetable may be propagated either by parting the roots, or by the seeds; as it will grow in the open air of our climate, and is far from being an useless plant. Its root was formerly kept in the shops, and is still occasionally employed for drawing blisters, and exciting salivation.—The leaves of lead-wort, according to BECHSTEIN, are vulnerary, and may be advantageously applied to the back of horses injured by the pressure of the saddle, or for healing other sores.

LEAF, a distemper incident to lambs, when about a week or fortnight old.—It has received this appellation; as the creatures feed on oak and hawthorn leaves, which cause them to foam at the mouth, reel and stagger, so that they suddenly drop down and expire.

Although we are not acquainted with any certain remedy for this malady, yet we believe it may be cured in its early stages, by giving the young animals thus injured, a mixture of equal parts of oil and vinegar, in frequent small draughts poured into the throat, and at the same time administering clysters composed of similar ingredients.

LEATHER, the skins of various quadrupeds dressed in a particular manner, for the use of manufactures.—See CURRYING and TANNING.

Dyeing of Leather: Different colours may be imparted to leather, according to the uses for which it is designed. Thus, a *blue* is given by immersing the piece for the space of twenty-four hours in urine and indigo, after which it is boiled in alum; or this colour may be communicated by tempering the indigo with red wine, and steeping the skins in the mixture.

A *red* colour is obtained, by first washing the skins, which are then soaked for the space of two hours in galls, wrung out, and immersed in a liquor prepared by a solution of privet (*Ligustrum vulgare*, L.), alum, and verdigrease in water; when they are steeped in a dye made of Brazil-wood boiled with ley.—In order to communicate a *purple*, the skins are wetted with a solution of Roman alum in warm water; and when dry, they are rubbed by the hand with a decoction of logwood in cold water.

Leather acquires a *light-green* tinge, by applying to it sap-green diluted with boiled alum-water:—a *dark-green* cast is communicated by means of steel-filings and sal ammoniac, steeped in urine for a considerable time, and well rubbed into the skin, which is then to be dried in the shade.

A *yellow* colour is given, by anointing the skin with a decoction of aloes and linseed-oil, previously strained; or, by immersing it in a solution of dyer's-green weed. Lastly, if fustic-berries be boiled in alum-water, and the skins dipped in the liquor, they will acquire a *light-orange* shade; but, if a deeper hue be required, it will be necessary to substitute turmeric for the berries.—For an account of the preparation of red, yellow, or other *Turkey leather*, we refer the reader to the article MOROCCO.

Leather being an article of extensive utility, especially for shoes and boots, various processes have been contrived for rendering it *water-proof*: we have already stated a simple method to this effect (vol. i. article BOOT); and, that our readers may become fully acquainted with this interesting branch of economy, we shall now give a supplementary account of the different preparations, &c. invented for that purpose.

In the 2d vol. of *Medical Inquiries and Observations* (8vo. Philadelphia,

delphia, 1793), Dr. Rush states the following mixture to be eminently calculated for rendering shoes, &c. impermeable to water. One pound of linseed-oil, eight ounces of mutton suet, six ounces of bees-wax, and four ounces of resin, are to be melted together; and, while moderately warm, to be applied both to the upper leather, and the soles of boots.—Dr. Rush remarks, that this cheap recipe was taken from *The Complete Fisherman*, a work published during the reign of Queen Elizabeth; and has, for many years, been employed with great success by the fishermen in America.

A patent was granted in 1794 to Mr. John Bellamy, for his new-invented method of making all kinds of leather water-proof.—For this purpose, the patentee has contrived two compositions, which are prepared in the following manner:

First method: One gallon of nut-oil, and an equal quantity of poppy-oil, are to be mixed with three gallons of linseed-oil; or, one gallon of nut, or poppy-oil, may be added to three of that expressed from linseed: or, two gallons of the latter may be combined with one pint of nut, and a similar quantity of poppy-oil. These ingredients (in the proportions above mentioned, or such as the nature of the oil may require) are to be poured together in an iron-pot, and placed over a gentle fire: to each gallon of oil must be allowed one pound of white copperas, sugar of lead, colcothar, or any other drying substance. The whole is to remain for the space of six or seven hours over such a degree of heat, as it will bear without rising, till it become sufficiently dry; when it may be taken off; and, as soon as it is cool, the compound will be fit for use.

Second method: Gum resin, one pound; pitch, half a pound; tar and turpentine, of each four ounces, are to be added to one gallon of the oils prepared according to the first method: these ingredients are to be well mixed with the oils, first, by gently heating the whole mass, then increasing the fire, till the whole become thoroughly incorporated.—The patentee specifies various proportions, in which the ingredients may be used; but experience will be the best guide to ascertain them.

When the oils, prepared conformably to the first method, or the gums, &c. according to the second, are sufficiently cool, Mr. Bellamy directs a brush to be dipped in the preparation, which should be rubbed into the leather. As soon as that article is thoroughly impregnated, it ought to be laid on an even board, and the superfluous matter removed from its surface. With respect to sole leather, or similar thick substances, he observes, that they should first be gently warmed; the composition is then to be applied till they are fully saturated; and, after being properly dried in a warm place, they will be ready for use.

In the *Memoirs of the Academy of Sciences of Turin*, for 1789, we meet with an interesting communication by M. de St. Real; on the means of rendering leather (especially that destined for soles) impermeable to water, without diminishing its strength.—This object, he conceives, may be effected, without any alteration in the usual method of tanning, by the common operations of currying; provided the skins be compressed in certain heavy rollers, after being previously immersed in beef-fat, or oil. The additional greasing, and pressing, will not greatly increase the price of sole-leather; which, after being a whole year in tanning, imbibes water in a much smaller proportion than cow-leather, when dressed with fat.—We regret that our limits do not permit us to specify the very ingenious experiments made by M. de St. Real; as we are convinced they will contribute to improve the art of tanning.

Another method of preventing leather from being penetrated by water, consists in exposing it with the flesh-side towards the fire: after which, a coat of warmed tar is to be applied with a proper brush, three or four times successively, according to the thickness of the leather, till the liquid matter penetrate through the whole skin. The durability and strength of shoes, &c. will be considerably increased, if, in laying on the last coat of tar, they be sprinkled over with a small quantity of fine iron-filings, which will, in a manner, fill up the pores of the leather. Lastly, shoes may be rendered impermeable to moisture, by occasionally rubbing the soles with hot tar: thus the feet may be preserved dry and warm; an important object in this climate, especially during the winter season.

Various acts of parliament have been passed, relative to the dressing, bringing of leather to market, &c. for the greater convenience of trade, and to prevent fraudulent practices; but, as they relate wholly to curriers, tanners, and leather-cutters, we shall not enter into detail respecting them.—This article pays at present, on importation, the prohibitory duty of 84l. 14s. per cent. according to its value; and is entitled only to a drawback of 25 per cent. on being again exported.

LEAVEN, strictly signifies *sour dough*, which acquires its acidity, when preserved after kneading flour with yeast, in order to ferment a larger quantity of paste.—It is a very imperfect substitute for *yeast*; and, as it communicates to the bread an astringent taste which few persons relish, it ought to be used only where barm cannot be procured. As, however, the latter ferment is sometimes difficult to be obtained, especially during the winter, we shall communicate the most simple methods of preparing as well as of preserving it, under the article Yeast.

LEAVES, in botany, are defined by Linnæus to be the organs of motion, or muscles of a plant: according to Dr. Darwin, they constitute the lungs of each individual bud.—See Bud.

Leaves are of a deeper green colour than the foot-stalks on which they stand; being formed by the expansion of the vessels of such stalks that produce several ramifications; mutually intersecting each other, and thus making a kind of net; the meshes of which are filled up with a tender porous substance, variously called the *pulp*, *pith*, or *parenchyma*. This net is provided, chiefly on the surface of the leaf, with a great number of porous or absorbent vessels, which are destined to imbibe the humidity of the air. The upper surface serves as a defence to the lower; and so essential is this disposition to the vegetable economy, that, if a branch be inverted so as to destroy the natural direction of the leaves, these in a short time will spontaneously resume their former position.

Leaves, therefore, are not merely ornamental to plants, but contribute in a very considerable degree to promote vegetation: thus almost every class of the vegetable creation is furnished with them, excepting mushrooms, and one or two other productions of the earth. Indeed, if any tree be deprived of its leaves, it cannot shoot vigorously; and, if it be totally divested of them, it speedily perishes. When, however, vegetation ceases, these organs of respiration and inspiration become superfluous: hence there are but few plants furnished with leaves throughout the whole year; the greater part is entirely deprived of them, and remains naked during the winter, producing new foliage with each returning spring.

The utility of leaves, in an economical respect, is very great, even after they cease to be essential to vegetation. Hence they should not be suffered to rot upon the ground, but carefully gathered in autumn; then exposed to a dry air, frequently turned, and thus made subservient to various useful purposes. Such leaves furnish an wholesome winter fodder for cows and sheep, either of which animals devour them eagerly. With this intention, they may be dried in a similar manner, and even mixed, with hay; and, if properly kept free from moisture, they may be easily preserved throughout the winter.

Nor are the leaves of vegetables, especially those of beans, less serviceable as a *manure*, for clay-soils, because the lower ones are very substantial, and yield, in the opinion of Dr. Darwin, a considerable portion of carbonic acid: hence it may be explained, that bean leaves, by continually dropping on the surface of the land, supply the earth with carbon, and thus render it more nutritive to such vegetables as may afterwards be cultivated. In this respect, they are greatly preferable to sheep's or cow's dung, because they never stock the soil with weeds, the roots or seeds of which are frequently propagated by the compost of ordinary dunghills.

The leaves of trees may also be advantageously substituted for saw-dust, in wine-cellars; and for horse-litter, or tanner's-bark, in hot-beds, for which they are eminently calculated; and, if trodden down closely, and properly moistened, they will gradually ferment, while their heat is more uniform and permanent than horse-dung: besides, there is no danger of burning or suffocating the plants in the frame. Vegetable foliage, likewise, affords an useful material for the stuffing of beds, bolsters, mattresses, and cushions. But, to prevent them from crumbling into dust, when frequently shaken, a correspondent, in the 1st vol. of the *Museum Rusticum et Commerciale*, observes, that they should be moistened while drying; as their contexture will thus be rendered more tough and elastic: we are inclined to recommend, with this intention, a weak solution of glue or isinglass.—They certainly merit a fair trial; and, as we have no doubt of their salubrity or softness, they might be beneficially employed by the poor, who may gather and prepare them with little trouble or expence.

Lastly, the leaves of the oak, ash, and alder, have lately been substituted for their respective barks, in the tanning of leather.—

Concerning the physical properties of leaves, in general, we are silent; as we treat of the more valuable medicinal plants in their alphabetical series; but we cannot conclude this article, without stating an ingenious remark of Dr. DARWIN; who is of opinion, that after their bitter particles have been extracted in a hot-bed, the leaves may be selected and converted into a spirituous drink similar to small beer, without possessing any disagreeable flavour: there is every reason to believe that such object may be effected by proper management; and the drink thus produced will doubtless be more wholesome than the adulterated liquors, which are imposed upon the public, by designing and avaricious persons.

LEECH, or *Hirudo*, L. a genus of insects comprising several species; the most remarkable of which are:

1. The *medicinalis*, or MEDICINAL LEECH, from three to four inches in length; its body is of a dark brown colour, with six yellow spots on the back; and a similar yellow line on each side; (though, in some seasons, these distinguishing marks are rather imperfect, and almost totally disappear): its head is smaller than the tail, and adheres very firmly.—This species is viviparous, inhabits clear running waters, produces in July only one young insect at a time, and is valued for its use in drawing blood.

2. The *sanguifuga*, or HORSE-LEECH, which inhabits stagnant waters, and is larger than the preceding; its skin is smooth and glossy; the body is depressed; the back is of a dusky colour; and the belly of a light green, with a yellow lateral margin.

3. The *Geometra*, or GEOMETRICAL LEECH, is only 1½ inch long, and has a smooth, glossy skin, of a dusky brown colour, but in some seasons is greenish, spotted with white. When in motion, its back is elevated, so as to form a kind of ridge, and it then appears to measure the space it passes over, like a compass; its tail is remarkably broad; and the insect holds as firmly by it, as by the head. This species is commonly found attached to stones in shallow running waters; and it likewise fastens itself on trout and other fish, after the spawning season.

The medicinal leech is the only one used for local bleedings. It may be applied with great safety and advantage, especially for obstinate head-aches arising from fulness of blood, as well as in many cases of external inflammation, with a view to extract the thick and superfluous humour with which the vessels are overcharged. If the leech will not readily fix itself, a few drops of milk may be rubbed on the spot where it is to perform the operation; or a little blood may be drawn, by making a slight puncture, after which it will immediately settle. When employed for relieving the piles, or to extract blood from the gums, it is requisite to secure the insect with a piece of rush, to prevent it either from creeping into the anus or gullet, in which cases it would occasion great distress, in the stomach or intestines. To induce the leech to quit its hold when it adheres longer than required, oil of tartar, volatile alkali, pepper, or acids, are occasionally employed; though a little common salt, strewed on its head, will answer the same purpose. On the contrary, if it be intended to draw a larger quantity of blood, the tail of the leech should be cut off; in consequence of which it continues to draw blood, in order to repair the loss it has sustained. The discharge occasioned by the puncture of a leech, is easily stopped with brandy, vinegar, &c. or may be kept open by applying warm fomentations.

As the geometrical leech often occasions great damage among trout and other fish, it has been recommended to throw a little salt water into the pond; but we doubt whether this expedient, by remedying one evil, would not be productive of still greater injury, by destroying the fish.

LEEK, or *Allium porrum*, L. a well-known vegetable, the native place of which is at present unknown, though it has long been cultivated in Britain.

The leaves of this plant possess a flavour similar to that of onions; affording a constant dish at the tables of the Egyptians, who chop them small, and eat them with their meat. They are also in great esteem among the Welch; and their general utility as a wholesome pot-herb, renders them a valuable culinary spice.—For the proper method of cultivating the leek, see ONION.

LEG, the lower extremity of animals, which serves both for their support and motion: it is generally divided into three parts; 1. the *thigh*; 2. the *leg*, properly so called; and, 3. the *foot*.

The human legs are subject to few complaints, except the common ulcers, the proper treatment of which we propose to state under that article. They are likewise apt to be sprained, fractured, or broken; in which cases great caution is requisite; but as those accidents are briefly discussed in their alphabetical series, the reader will consult the articles FRACTURES and SPRAINS.—See also BANDY-LEGS.

LEGUMINOUS VEGETABLES. See PULSE.

LEMON-TREE, or *Citrus Lima*, L. an elegant evergreen, indigenous in Persia, rising from 5 to 10 feet in height, producing beautiful large leaves, with a profusion of sweet flowers in the spring and early summer; which are generally succeeded by an abundance of fruit, that sometimes arrives at tolerable perfection even in Britain.

The culture of this plant is, in all respects, similar to that of the CITRON; for an account of which we refer to the 2d volume.

LEMON-JUICE, an agreeable acid, obtained from the fruit of the lemon-tree. This juice, as well as that of the citron and orange, is of considerable utility in medicine. Sir JOHN PRINGLE highly praises its efficacy in the sea-scurvy; it is also frequently used for neutralizing alkaline salts in the preparation of saline draughts.—The yellow peel of lemons has a more concentrated aromatic flavour than that of the orange; and, like that of the citron, is often candied, and sold under the name of *sweet-meat*. The dried peel is a good stomachic, promotes the appetite, and imparts warmth to the whole frame; but it should not be combined with spirituous liquors in a *fresh* state, as it renders the punch or negus still more heating and hurtful, by its highly inflammable oil; which is, therefore, employed chiefly by perfumers.—The juice, as well as the oil of lemons, may be usefully combined with the saccharine and tartaric acids, in the form of *laxative powder*, by the following easy process. Half a pound of refined sugar should be rubbed on the peels of two lemons, till the yellow part is entirely consumed; then the sugar is to be triturated in a glass or marble mortar; the juice of the same lemons dropped on the mass, and the whole suffered to stand in a glazed vessel, till it become sufficiently dry to be again reduced to powder. Eight ounces of pulverized crystals of tartar are now to be incorporated with the former: a few small tea-spoonfuls of this mixture, in half a tea-cupful of spring water, taken at night, or an ounce of the powder given in divided doses through the day, generally produce a mild laxative effect, in costive habits.

Lemon-juice is one of the most cooling and antiseptic vegetable productions: it ought to form an article of the side-board, as well as the medicine-chest; for it improves the taste, and corrects the putrid tendency of animal food in the summer. Hence lemonade affords a grateful and cooling beverage for febrile patients; but it should be remarked, that the acid of lemons must never be freely given to persons, whose breast or respiration is affected.

LENITIVE ELECTUARY, a preparation kept in the apothecaries' shops, and consisting generally of two parts of pulverized senna; one part of coriander seeds in powder, incorporated with four parts of the pulp of tamarinds; a similar portion of prunes; and a sufficient quantity of simple syrup, so as to reduce the whole into an electuary.

It is chiefly employed as a gentle aperient in doses of one tea-spoonful, taken frequently in the course of the day; but, as it is apt to become mouldy, and to lose its efficacy, if kept too long, it ought to be newly prepared, and may be more advantageously employed as a vehicle for administering the more active medicines.—Nor should this compound be indiscriminately swallowed by the lower classes of people, who thus cloy their stomachs on every occasion, without knowing whether it be a proper medicine for their complaint.

LENTIL, or *Ervum Lens*, L. an useful exotic vegetable of the pulse kind, that has long been cultivated in Britain.

It is propagated from seeds, which are either sown in the proportion of from one bushel and a half to two bushels broad-cast, or are drilled in rows one foot and a half a part, in order that the intermediate soil may be properly cleaned with the Dutch hoe. Sometimes, however, this vegetable is put in the ground together with oats or barley, at the rate of one bushel of the latter to two bushels of the former.

The lentil is an annual plant, growing to the height of about 18 inches, and producing pale purple flowers, which are succeeded by small flat pods, containing two or three round seeds. These are frequently used in soups, the flavour of which is thus much improved: the plant itself affords an excellent fodder for cattle.—When, however, lentils grow among oats or barley, they should be cut while in full sap; for, if well dried and preserved, they afford an inviting food, though of a heating and flatulent nature.—Nor is the fruit itself more wholesome to mankind; and BECHSTEIN observes, that it is hurtful, nay, sometimes fatal to horses.

There is another kind of lentil cultivated in this country, under the name of *French Lentil*, or *Tills.* It is in every respect a plant twice as large as the preceding, and is supposed to be a distinct species. It is raised from seeds, which are sown in March, in a soil that bore corn in the preceding year, and has been once ploughed. Manure is not absolutely necessary, though it will greatly increase the crop; which is said to be very copious, and may be mown several times in one season.

The stalks and foliage of this kind of lentil, furnish an agreeable and wholesome food to horses, sheep, and particularly to cows: while they considerably increase the quantity, and improve the quality of their milk. Its long and numerous pods ripen late in autumn, and produce a new species of pulse, which may be dressed in the same manner as the common lentils: in a fresh state, they may also be used as an excellent ingredient in soup; and, when dry, they are eagerly eaten by poultry. The dried herb, likewise, furnishes a good winter fodder for cattle; and, as this vegetable thrives on the poorest land, it deserves to be more generally cultivated.

LEOPARD's-BANE, or *Doronicum*, L. a genus of plants comprising seven species; the principal of which is the only indigenous one, termed *Pardalianches*, Great Leopard's-bane, or Wolf's-bane, growing on the banks of rivers, and in the Lowlands of Scotland: it produces yellow flowers in the months of May and June.

This plant delights in a moist soil, and a shady situation: its spreading roots multiply so rapidly, and the seeds, if carelessly scattered about the land, produce plants so abundantly, as very soon to become a most troublesome weed.

The roots of the leopard's-bane were formerly employed in medicine, as alexipharmics and purifiers of the blood; but, on account of their violent operation, have been justly exploded.

LEOPARD's-BANE, the GERMAN, or *Arnica montana*, L. an exotic plant growing wild on the Alps, and on the high mountains of Germany.

This vegetable delights in a moist, shady situation: it may be propagated in autumn, when the stalks begin to decay, either by parting the roots, or by sowing the seeds, soon after they become ripe. It is a very hardy plant, and requires no other care than to be kept clear from weeds.

The German Leopard's-bane possesses an acrid, bitter taste; and, on bruising it, emits a pungent odour, which excites sneezing. Hence the country people, in some parts of Germany, employ it in snuff, and smoke it as a substitute for tobacco.

Various medicinal properties are attributed to this vegetable: it has been chiefly recommended in paralytic affections, and in cases of gutta serena. For the removal of such disorders, an infusion is to be made, of from one to four drams of the flowers, in a pint of boiling water; and the liquor to be taken in divided doses, in the course of the day. Although the use of this remedy is frequently attended with no sensible operation, yet sometimes it produces vomiting, sweating, or a copious discharge of urine; and, in some paralytic cases, the cure is said to be preceded by a peculiar prickling sensation, and by shooting pains in the affected parts. It has also of late been recommended as a very powerful antispasmodic; and it is said to have been successfully employed in agues, as well as in gangrenous affections; where it is asserted to be equally efficacious as the Peruvian bark, when administered in the form of an electuary with honey. But, as the alledged virtues of the German Leopard's-bane, have not hitherto been confirmed by the experience of British practitioners, the real efficacy of this active plant remains to be ascertained by future observations. If, however, too large a dose of this medicine should have been swallowed by mistake, its most effectual antidote will be *vinegar*, which ought to be taken without delay, in copious draughts.

LEPROSY, or *Lepra*, a cutaneous disorder, in which the skin is rough, with white eschars resembling bran, though they are sometimes moist beneath the surface, and accompanied with an intense itching.

This loathsome distemper, though at present very rare in Britain, is sometimes caused by the gout; melancholy; by touching the torpedo; but more frequently arises from the eating of impure flesh, especially that of swine which had been infected with the *murrain*.

Various remedies have been devised for the cure of the leprosy: among these, mercury, both internally and externally; sea-water; the cold bath; and the purging mineral waters, have been successfully employed. The expressed juice of the common fumitory (in doses from 20 to 60 drops, frequently repeated), has likewise been prescribed with advantage; and, according to Dr. LETTSOM, a decoction of the inner bark of the elm has removed the complaint, even after antimonials and mercurials had failed. The diet of patients afflicted with this malignant eruption, ought to consist chiefly of milk, carefully avoiding whatever may irritate the system.—Their daily drink should be either whey or butter-milk.

The leprosy is not peculiar to man, but frequently appears among quadrupeds, especially hogs; when it is generally called the MURRAIN; under which article we shall point out a few of its appropriate remedies.

LETHARGY, or *Lethargus*, a species of apoplexy, which is manifested by an invincible drowsiness, or inclination to sleep, from which the patient is with difficulty awakened; and, if roused, he remains destitute both of sense and memory; so that he soon relapses into his former sleep. It is attended with an increased degree of heat; slow fever; full pulse; paleness; swelling of the eyes; and a coldness of the extremities.

Various circumstances concur to produce this affection: the more remarkable of these are, injuries of the brain, arising either from external or internal causes; congestions of blood in the head; terror, anger, or other depressing passions; to which may be added, sneezing medicines, and strong exhalations of flowers.

Many remedies have been employed to remove this growing drowsiness, with different degrees of success. In plethoric persons, blood-letting, blisters, and emetics, have often procured relief. Considerable benefit has also been derived from the sudden affusion of cold water upon the head; from the use of stimulant clysters; and the burning of feathers, or other fetid substances, held near the nostrils. The patient ought to avoid whatever is difficult of digestion, such as heavy salt meats, fish, milk, and cheese. His diet should be light, and taken in small quantities; while he must endeavour to resist and counteract the propensity to sleep, by frequenting chearful company, taking daily and moderate exercise in the open air, or similar exhilirating means.

Lethargy, *in Farriery,* a disorder to which horses are frequently liable. It is easily discovered, when the animal rests his head with his mouth in the manger; is often inclined to eat, but generally falls asleep with the food in his mouth, and frequently swallows hay or corn without chewing it.—In such case, emollient clysters are equally useful and necessary: it will also be advisable to take a little blood, if the horse be young and robust, but in old animals, diligent curry-combing, and moderate walking, or occasional bathing in the sea, or a river, will be more conducive to their cure. Volatile salts, and other pungent odours, are here likewise of service, and should be often applied to the nostrils.—The following alterative purge may be administered, and repeated, if there be a prospect of recovery: Take one ounce of socotrine aloes, half an ounce of myrrh, two drams of asafœtida, a similar quantity of gum ammoniac, and one dram of saffron. These ingredients are to be carefully mixed, and formed into a ball, with syrup.

Such remedies are generally attended with success, if the horse be not old, but in the possession of its vigour. Farther, it is a favourable symptom, if he have a tolerable appetite; drink freely, without drivelling; lie down and rise carefully, though seldom. But, if the contrary circumstances occur, and the animal be altogether listless, taking no notice of whatever happens about him; if he dung and stale rarely, while he is sleeping and dozing; these appearances prognosticate a speedy dissolution, which cannot be prevented by art.

LETTER, in its primitive sense, denotes a character of which the alphabet is composed; but it is commonly used to signify a written address to an absent person. The term letter is often, though ironically, confounded with *epistle,* which more properly applies to scripture, or the writings of the ancients; but, according to its modern import, to a poetical, or other formal declaration.

A *letter* ought to consist of three parts; namely, the introduction, the subject on which it is written, and the conclusion. In familiar correspondence, the first may occasionally be omitted; more rarely the third; but by no means the second, as it is the most essential part of a letter.

If the nature and dignity of style be considered, a letter admits of every modification of language. Hence a confidential tone may prevail in friendly and facetious correspondence; a middle style, partaking of the serious and didactic, in letters on business, as well as in narratives of events, and philosophical disquisitions; lastly, a sublime style, when sacred duties are to be inculcated, or exalted ideas to be excited.

As a letter is intended to supply the place of verbal conversation, it follows, that the language of civilized life, or social intercourse, is the safest guide to epistolary composition. Let us therefore write as we would speak, if the person to whom the letter is to be directed, were actually present. Hence an easy, and simple arrangement of ideas will, in general, be the most suitable. But, as a letter is a more permanent declaration of sentiments than a verbal profession, the former consequently requires a greater choice of expression, prudence and reflection, than is generally bestowed on oral conversation; hence, it is not entitled to those concessions or indulgencies which are readily granted to the transitory words of the former. Thus, purity of diction, perspicuity and precision of ideas, together with a lively and unaffected mode of expressing them, are the principal requisites of a good letter.

One of the most necessary rules of letter-writing is *conciseness*. In addressing our superiors, we ought therefore to make use of no phrases or circumlocutions, which tend to confound rather than to explain the subject.—Diffuseness breeds ambiguity, and often represents a number of words without meaning. Hence a *long* letter may not unaptly be compared with a tedious person, who is constantly moving, as it were in a circle, but never arrives at the end of his journey.

A short and satisfactory treatise on the subject of writing letters, appears to us still wanting; though many useful remarks and rules are interspersed in the works of WARD, JOHNSON, BLAIR, and other didactic writers.

LETTUCE, or *Lactuca*, L. a genus of plants comprising 15 species, two of which are natives of Britain: the principal of these is the *virosa*, Wild or strong-scented Lettuce, that abounds on chalky soils, and dry banks of ditches; flowers in the months of August and September. It has a strong odour, not unlike that of opium, and is possessed of similar narcotic properties, that reside in its milky juice; small doses of which, newly expressed from the plant, are recommended in the dropsy. It is said to agree with the stomach, to allay thirst, and to be mildly laxative.

Several other species and varieties of the Lettuce have, at different times, been introduced into Britain, and are now cultivated for culinary purposes. The principal of these are: 1. the Common or Garden Lettuce, which is propagated from seeds that are generally sown early in the spring, that the plant may be cut and mixed with other salads. In its more cultivated state, this kind is known by the name of Cabbage Lettuce. 2. The Silesian. 3. The Imperial. 4. The Royal Black; and, 5. the Upright White Cos-Lettuces, which are the most valuable plants of this nature, now reared in our gardens. They are likewise raised from seed, which should be sown towards the end of February, or in the beginning of March, on a warm light soil, and in an open situation. As soon as the plants shoot forth, it will be necessary to *thin* them, so that they may be 15 inches apart in every direction, after which they will only require to be carefully weeded; and, as the Black Cos-Lettuce grows large, it will be necessary to tie its leaves together, in order to whiten the inner part.

There are two other sorts, known under the name of *Dutch brown* and *Green Capuchin* Lettuce, which may be sown late, under walls; being very hardy, they withstand the severity of the winter, and will be valuable when no other green salad can be procured.—Bechstein states a curious fact, which deserves to be recorded, namely, if the two varieties last mentioned be planted together, and suffered to bear seeds, in a rich, warm, but moist soil, the future produce of such seed will be a new and very excellent kind of this plant, forming extraordinary large heads, the leaves of which are sprinkled with deep red spots, and uncommonly tender.

Properties:—The various kinds of garden-lettuce are emollient, cooling, and wholesome salad-herbs; they are easy of digestion, somewhat aperient, and supposed to possess a soporific quality: there is no doubt, that by abating heat, and relaxing the fibres, they in many instances contribute to procure rest. But, for this purpose, lettuces should not be eaten with oil and vinegar, as the former renders them less digestible; but, if either or both of those condiments must be used, it will be advisable to add sugar, which will counteract the rancid nature of the oil; though simple salt is the most proper spice for salads.

Lettuce, the *Hair*. See Common Sow-Thistle.

LEVEL, an instrument by means of which a line may be drawn parallel to the horizon, in order to determine the height of one place with respect to another; for laying grounds even, conducting water, regulating descents, draining fens, &c.

There are various kinds of levels, adapted to different purposes, of which we shall notice only such as are of a simple construction, and in general use.

1. The *Carpenters'* and *Paviors' Level* consists of a long ruler, in the centre of which is fixed, at right angles, another somewhat larger, and at the top of which is fastened a line, that shews the base to be horizontal.

2. The *Masons' Level* is composed of three rules, so joined as to form a rectangle, somewhat similar to the letter A; from the top of which a plummet is suspended, by means of a thread that passes over a perpendicular line marked in the middle of the base, if the object to which the level is applied be horizontal; but which deviates from such mark, in case one side be lower than the other.

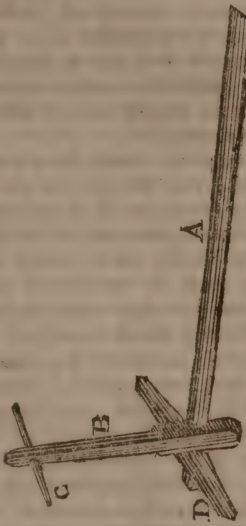
3. The *Water Level*, which shews the horizontal line by means of water or any other fluid, is founded on the principle that water is always level. The most simple instruments of this kind are made of a long wooden trough or canal, the sides of which are parallel to the base; so that, when it is equally filled with water, its surface points out the actual degree of declivity. Or, it may be made with two cups fitted to each end of a pipe, three or four feet long, and about one inch in diameter, so that the water may communicate from one cup to the other: and, as this pipe is moveable on its stand, by means of a ball or socket, when the two cups become equally filled with water, their surfaces shew the line

of level.—Instead of cups, however, two short glass cylinders, three or four inches in length, may be fixed to both extremes of the pipe, with wax or mastic. Some water, either plain or coloured, is now poured into the pipe, when the liquor appears through the cylinders, and thus the horizontal line is determined. This contrivance is very simple, and of great service for taking the level of small distances.

There are various other kinds of water levels, which have been designed with a view to ascertain declivities, for the purpose of irrigating land: as these, however, are either too complicated, or otherwise defective, we refer the reader to p. 31, of the present volume, where he will find an account of a more simple contrivance, illustrated with a cut, by Dr. ANDERSON; and which is calculated to remove these difficulties.—Lastly, though we have several other instruments for taking levels in particular situations, yet, as their application requires a previous knowledge of mathematics, and is not strictly connected with domestic economy, our limits do not admit of farther descriptions.

LEVER, a bar made of iron or wood, one part of which is supported by a fulcrum or prop, so that all the others turn upon it as their common centre of motion.

Levers are of various kinds, according to the purposes for which they are designed; and, being eminently serviceable for the lifting of weights, we have subjoined the following representation of a *Cross-bar-lever*, which is particularly calculated for raising earth that abounds with great quantities of stones; though this machine is likewise applicable to other objects.—It was invented by Mrs. WYNDHAM, of Petworth, in Sussex, on whom the Society for the Encouragement of Arts, &c. in 1796, conferred their silver medal.



A, is the lever.

B, an upright piece of wood, to be affixed to the lever; care being taken to place the side marked with this letter opposite to that marked A on the lever; by which means it inclines backwards, and thus increases the power.

C, is a cross-bar, being the hand by which the workmen exert their strength.

D, is another cross-bar, to be placed at the bottom, behind the upright piece of wood, on which the labourers are to stand, and through which the end of the lever passes. These additions are so constructed, that they may be occasionally fixed and removed; because they are to be employed only, when the strength of the rock, or earth, requires an increase of power.

Should the rock be elevated so considerably above the ground, as to endanger the men by its fall, when the separation takes place, the lever may be reversed; so that the labourers will stand upon the bar intended for the application of their hands, in common cases; and thus all danger will be effectually prevented.

Various other levers have been contrived; but, as they relate to particular branches of mechanics, we shall only take notice of Mr. Snart's *sliding lever*, which he quaintly calls an *alexippos*; and which was also laid before the patriotic Society above-mentioned.—As various accidents happen to horses that frequently fall, while they are in the shafts; and the present construction of carts, as well as other two-wheeled carriages, is especially unfavourable to the animal in such a situation, by preventing him from being speedily raised; Mr. Snart has contrived a lever for the express purpose of relieving the unfortunate quadruped. He farther states, that it may occasionally be of service in loading carts, where the common length of those vehicles is not in proportion to the articles to be carried.

The contrivance is ingenious, and, notwithstanding its pedantic name, deserves to be more generally known: but, as we are not disposed to enter into particulars, the inquisitive reader will resort to the 18th vol. of the *Transactions of the Society for the Encouragement of Arts*, &c. where this invention is fully described, and illustrated with an engraving.

LIENTERY, or *Lienteria*, is a species of diarrhœa, in which the food passes through the intestines, almost without having undergone any change: it is not attended with pain, but the patient is frequently affected with an intolerable hunger.

This disorder is occasioned by the relaxed state of the stomach, and is sometimes the consequence of dysentery, though it generally occurs during the earlier periods of life.

Considerable benefit may be derived by administering rhubarb, combined with magnesia; but, if the patient be an adult, it will be necessary to resort to stomachics and tonics, especially the Peruvian bark.

The lientery is seldom a very dangerous disease, unless the patient be of an advanced age; or the constitution be broken by excess, or acute diseases: in either case, the diet and treatment must be the same as in the Dysentery, to which we refer.

LIFE, in a peculiar sense, denotes the animated state of living creatures, or that space of time during which the soul is united to the body.

Longevity has always been highly estimated by man; hence the art of preserving life has become an important study, and ought to form part of the education of every individual.—There is, however, a period at which mankind cease to grow; and beyond which our existence continues for a limited time. Thus, if a person attain his full growth at the age of fifteen, he generally dies at that of sixty; provided that no accidents intervene, by which the vital principle be affected, and prematurely extinguished. According to the calculations of others, every animal body is by Nature destined to live *eight* times the length of its growth.

From the most accurate political accounts, made by comparing the bills of mortality published in different countries and climates, we shall insert the following result:—Of one thousand persons living in large cities, no less than thirty-five or thirty-six die annually; while, in country places, or small towns, only from twenty-eight to thirty deaths happen in a similar period. Among 1000 children, five die during parturition; and scarcely half that number in child-bed; but about 300 are computed to fall victims to a perverse mode of education, though suckled by their mothers; and not less than 500, or one half of all that are born, if reared by wet-nurses. The mortality of infants, indeed, has increased to a most alarming degree in this luxurious age; as the plurality of them is carried off by convulsions, and difficult teething. Among 115 dead persons, there is only one woman deceased in child-bed; and, of 400 mothers, one only by previous pains.—A greater proportion of boys than of girls die of the natural small-pox.—There are always to be found more aged persons in hilly or mountainous countries, than in low situations; and it is proved by the most authentic computation, that, of 3,125, only one individual survives the hundredth year. From the same source, the following is the most probable chance which persons may have for the duration of their lives, after a certain fixed period, namely:

	Years.	*Months.*
A new-born infant will probably live -	34	6
A person of 1 year old - - - -	41	9
3 - - - -	45	7
5 - - - -	46	4
10 - - - -	44	9
15 - - - -	41	6
20 - - - -	38	3
25 - - - -	35	3
30 - - - -	32	3
35 - - - -	29	8
40 - - - -	26	6
45 - - - -	23	0
50 - - - -	20	11
55 - - - -	17	0
60 - - - -	14	2
65 - - - -	11	5
70 - - - -	8	11
75 - - - -	6	8
80 - - - -	4	10
85 - - - -	3	3
90 - - - -	2	0

The proportion of the female sex to that of males, with respect to the number of deceased, is as 100 to 108.—Previously to the 60th year, the chance of survivorship is in favour of women; but, after that age, men generally survive them.—Married women, on the whole, live longer than those in a state of celibacy.—From observations made for the space of 50 years, it is evident, that most persons die in the months of March, August, and September; but the fewest in November, December, and February. In populous cities, however, such as London and Paris, death makes the greatest havoc during the *winter*.

One half of the human race is doomed to dissolution, before they have completed the 17th year of their age; but, after this critical period, the survivors' chance of life becomes more valuable with every year: hence, for instance, a person thirty years old, according to the preceding calculation, will probably live thirty-two years longer; so that he may attain the age of sixty-two; whereas a youth of fifteen, though he have a chance of living forty-one and a half years longer, will nevertheless arrive only at the 56th or 57th year of his age.

Conformably to the observations of BOERHAAVE, the most healthy children are born in the months of January, February, and March: indeed, the greatest number of births takes place during the two months last mentioned. The proportion of boys, annually born, is to that of girls as 104 to 100; but, on the other hand, a greater number of the former die during infancy than of the latter; so that, about the age of puberty, both sexes are nearly equal.—Among 65 or 70 infants, there is generally but one instance of *twins*.—The number of marriages, compared to that of the whole population of a country, is as 175 to 1000. Four children are generally computed to arise from each married couple; but, in towns, only thirty-five children from ten families.—Lastly, it is proved from the records of the most experienced physicians, that, among 100 persons living in cities, throughout the year, only twenty are indisposed, or confined to their beds for one month; or twenty-four for the space of a fortnight.

With a view to prolong human life, Lord BACON recommends the bath, after which unctions of salves and oils are to be applied, in order to exclude the influence of the external air. In his opinion, a cooling diet, opiates, or narcotics, are the best means of preventing the internal consumption of the body, and to renovate it, when such decay has commenced. In certain constitutions, these remedies may possibly be productive of some advantage; but it is an erroneous idea, that they will be universally beneficial: the whole of his project is more specious than practicable; and the basis on which his theory was apparently supported, has no real foundation.

We have already pointed out the most proper treatment of persons in a feeble state, under the article DEBILITY; and, at the same time, stated the necessary rules and direction for the preservation of health, and consequently the prolongation of life. There is, however, so much justice in the observations of the late illustrious HALLER, on this subject, that we are induced to insert the following brief statement.—He remarks, that some of the causes which contribute to protract life, beyond its usual period, are *external*. Such, for instance, is climate: hence, the more northern latitudes, or about 50 degrees, are the most proper for youth; because, in such a region, the circulation is less rapid, and acute diseases seldom

dom occur. But in a more advanced age, when the pulsations of the heart are faint or slow, and its irritability is diminished, a warmer region is more salutary; and he recommends aged persons to migrate 30 or 40 degrees, or even nearer to the equator, where they may enjoy, at pleasure, the genial warmth of the sun, or the cooling shade.

Among the *internal* causes of longevity, the rudiments of a sound body, descended from parents uncontaminated by hereditary disease, are to be considered as the principal: thus dropsy, gout, apoplexy, consumption, and the long train of disorders, that are too frequently transmitted from one generation to another, will in a great measure be prevented. With respect to the mode of living, HALLER recommends abstemiousness during youth; the drink should be water, which Nature has provided for our common use; and he justly considers wine as a species of medicine. Animal food should be sparingly eaten, together with a large proportion of vegetables, and but a small addition of saline or aromatic substances. Temperance is, in every respect, an essential point; so that the quantity eaten, may be well digested, and perfectly assimilated; that the blood may circulate regularly, and free from all corruption or infection, similar to that of an infant. Aged persons, however, may somewhat more freely indulge in the use of animal food: on the other hand, tranquillity, both of body and mind, is of the greatest consequence; as nothing is more detrimental, than an irritable or irascible disposition. Hence, a due mixture of a lively and placid temperament, is a very desirable condition, so as to be neither insensible of pleasure, nor too much addicted to the gratification of sensual desires. Moderation is, therefore, here likewise a beneficial attribute; but, with regard to sleep, old and decrepit people may be more indulgent.—Those readers, who are anxious to become acquainted with more minute rules and directions for prolonging human life, both in a state of health and disease, will derive considerable information from Professor HUFELAND's "*Art of prolonging Life*" (8vo. 2 vols. 10s. Bell, 1797), and from Dr. STRUVE's *Asthenology: or, The Art of preserving feeble Life*" (8vo. 8s. Murray and Highley, 1801), in which the subject is amply and philosophically discussed.

LIFE-ANNUITIES. See ANNUITY.

LIGATURE, a bandage or fillet, made of linen, flannel, leather, or any other elastic substance, which is generally tied round the arm, to facilitate the operation of blood-letting.

Ligatures are likewise used to extend or replace bones, which are broken or dislocated; on the arteries, during amputations, or in large wounds; and also to secure the splints that are usually applied to fractures.

Although the instinctive propensity of the lower animals, to pinch or compress wounded or painful limbs, seems to have furnished mankind with a hint for the application of tight bandages or ligatures, with a view to intercept the nerve in its course from the part affected to the brain; yet such practice is not always safe. We know instances where, in consequence of too long continued compression of the blood-vessels (previous to a surgical application) the *tourniquet* had produced so powerful an effect, that after removing it, the contorted limb was insensible, paralytic, and sometimes mortified.

LIGHT, signifies that invisible fluid which renders objects perceptible to the sight.—The velocity of light is almost inconceivable, though its motion is not instantaneous: the particles of light fly nearly 200,000 miles every second of time, which is above a million of times swifter than the passage of a cannon-ball. And, as half the diameter of the globe we inhabit, extends to 90,000,000 of miles, the rays of the sun travel that vast distance in 8¼ minutes, before they illumine our earth.

The nature of light has, at all times, been a subject of speculation among philosophers; and various theories have been formed and rejected, or succeeded by others that were more plausible, though inconclusive. Sir ISAAC NEWTON conjectured it to consist of rays, some of which possessed a greater degree of refrangibility than others: subsequent philosophers are not yet agreed, whether light and heat are the same fluid under different modifications, or two distinct fluids which are frequently united. Amid this concussion of opinions, it is difficult to select the most probable; we shall therefore briefly state the effects of this agent upon the vegetable and animal creation.

Light is essentially necessary to vegetation: in our climate, it is seldom productive of injury by its excess, though the want of it is often pernicious. This fluid acts as a kind of stimulus on the more irritable parts of plants; as appears from the sun-flower and others, that expand or bow when exposed to the rays of the sun: hence Dr. DARWIN supposes there may be diseases in plants, arising from the excess of this stimulus, but which, he thinks, have hitherto been disregarded. To corroborate this conjecture, he specifies the Goat's-beard, or Salsafie (*tragopogon*, L.), and some other vegetable productions, which close their flowers about noon, in order to prevent the influence of such stimulus.

On the contrary, the absence or defect of light produces a disease called *etiolation*, or *blanching*, because vegetables deprived of that fluid become white. It has a similar effect on animal bodies; which, as Dr. DARWIN has pointedly remarked, are in consequence rendered pale and inert: this is confirmed by the languid and *etiolated* countenances of the young ladies in some boarding-schools, where, from false motives of delicacy, they are secluded both from the light of the sun, and the invigorating influence of the air: it is still farther evinced in those studious persons, who pass their waking hours in unventilated apartments, especially during a considerable part of the night.

But, though such *etiolation* be naturally injurious to vegetation, it has been artificially employed with success, in rendering certain plants esculent, by depriving them of their acrimony, cohesion, and colour. This method is chiefly practised on celery, by earthing up that plant nearly to the top; on sea-kale, by covering it entirely with horse-litter or straw; and, lastly, on lettuces and endive, by tying the root-leaves together with a banda bandage.—On the chemical effects of light, we are silent; for the opinions respecting them are not less unsettled than those concerning its nature.—The inquisitive reader will find ample information on this subject, in the writings of Dr. PRIESTLEY, and also in the different volumes of the *Transactions of the Royal Society*.

LIGHTNING, a vivid, bright flash of fire, which suddenly appears in the atmosphere, and instantly vanishes: it is sometimes attended with heavy clouds and thunder; but often occurs while the sky is serene, especially in sultry summer evenings.

The phenomena accompanying this meteor are always surprizing; but, in many cases, truly terrific:—various causes have been assigned by philosophers, with a view to explain them. Some suppose lightning to arise from inflammable matter, consisting of the sulphureous and nitrous vapours exhaled from the earth, and carried into the atmosphere; whence the more fiery particles are separated, so that they explode by the concussion of two clouds, or some other cause, in various directions of a greater or less extent, according to the strength and quality of the materials. Others conjecture lightning to be formed by the fermentation of sulphureous matters with the nitrous acid. It is, however, now generally understood to be an electrical phenomenon.

In common with electricity, lightning possesses the property of burning and dissolving metals; it rends bodies, often deprives persons of sight, and sometimes extinguishes the vital principle; divests magnets of their virtues, and reverses their poles. Indeed, there is no appearance in Nature, that presents a greater diversity to the contemplative mind; for each flash is widely different from another; nor are its effects alike fatal.

When the igneous meteor exhibits a deep red colour, it is seldom accompanied with dangerous consequences; but, if the flashes be bright, pale, and in a zig-zag direction, destruction generally marks their course. The most mischievous form, however, which lightning assumes, is that of fiery balls: wherever such masses descend, they burst, and occasion extensive damage.

As lightning uniformly strikes the most elevated objects, such as lofty trees, steeples, and particularly the masts of ships and chimnies of houses, various expedients have been contrived, in order to divert, or at least break, its force. These efforts of human ingenuity were first published, or recommended to public notice, by Dr. FRANKLIN; and, from their acknowledged utility, CONDUCTORS are now generally adopted:—we have already pointed out the most judicious form of constructing them, in pp. 47 and 48, of our 2d volume.

Another method of preventing the fatal effects of lightning, consists in the artificial attraction of electrical matter from the clouds, by means of a KITE. Having, under that article, stated the manner in which this useful machine should be constructed, we shall now communicate a few directions for its proper management.

In order to adapt the *electrical kite* to the important purpose of affording security during a thunder-storm, especially when persons are exposed to its influence in an open field, it will first be requisite to fix a thin a thin iron point, about 12 inches long, on the top of the machine, marked *a* (see p. 51); then to surround the whole leading string with a thin iron wire, which should be previously connected with the metallic point. Having made these preparations, a strong wooden staff, three or four feet long, must be procured, and likewise furnished with a firm iron point on its lower extremity, and a similar ring on the top, so that it may also serve as a walking-stick. But there ought also to be a stronger iron wire affixed to this staff, either in a perpendicular or serpentine direction, so as to communicate with both the ring and the lower end, which is to be forced about 12 or 18 inches into the ground, according to its softness; in order to support the whole machine, while suspended in the air.—On the approach of a thunder-storm, and before it actually breaks out, it will be advisable, first, to drive the staff sufficiently deep into the ground, so that its strength may be adequate to the force of the wind; then to fly the kite thus prepared with the greatest expedition; and lastly, to fix the string, with its accompanying wire, to the iron ring of the staff before described. In this easy manner, all danger of being struck by lightning may be effectually averted; but it ought to be remarked, that no person should afterwards approach this electric staff; though any number of people working in the fields, even diametrically opposite to the floating body of the kite, will be protected by its conducting power; provided they keep at the distance of twenty yards, at the least, from the staff to which it is fixed.—Nor will it be proper to fly the machine during a shower of rain, or very boisterous weather.

Persons struck with lightning may, in many instances, be restored by proper and timely applications. In slighter cases, where particular limbs are affected, the wounded part has been cured by washing it with a solution of sugar of lead.—According to TODE, considerable relief has been derived from applying opium to the painful part of the breast, after being hurt with lightning; and a person, wounded by this meteor, was perfectly cured in the course of ten days, by the application of ley to the part affected, and by the internal use of carbonate of pot-ash, or fixed vegetable alkali dissolved in water.—Should, however, any person be apparently killed by such an accident, he ought by no means to be neglected, or precipitately committed to the grave; for we are persuaded, that many *might be* restored, if proper resuscitative means were employed.

In general, there are no external marks discoverable, when the body has been injured by a flash of lightning; though sometimes red streaks appear on different parts, especially on the chest and arms, in which the patient, after recovery, experiences a sense of burning heat.—The first step should be, to remove the body from the farther influence of mephitic air of the place, where the unfortunate blow was inflicted. Clothes and bandages of every kind must be removed; the body placed in a reclining posture; and the head raised, somewhat leaning to the right side: thus the subject is to be covered with warm blankets or cloths; while both the doors and windows are opened for admitting fresh air.

Resuscitatives: Sprinkle the face with cold water; put the whole body up to the neck, if convenient, in the earth-bath, where it should be kept for several hours, till certain signs of returning life appear: or expose the subject, if robust, to the influence of the shower-bath; apply cold poultices to the head; cloths dipped in vinegar to the pit of the stomach; and gentle friction, which should be resorted to, alternately, with the sprinkling of cold water, from the beginning of the process; at first with great caution, over the lower extremities, and gradually extending it upwards to the left side of the body.

In particular cases, where the means before stated prove ineffectual, it will be advisable to open a vein, or to electrify the patient, by directing the shocks through the breast, so that this fluid may pervade the heart.—Meanwhile, pure air may be blown into the lungs (see vol. ii. p. 190); and, if anxiety appear to prevail, blisters should be applied to the chest.

When *signs of returning life* become evident, the mode of treatment before pointed out, must be continued for some time, though with great moderation. The cloths applied to the pit of the stomach, should now be dipped in wine, or *warm* vinegar; common poultices applied to the injured parts; and emollient clysters may be occasionally given.—Lastly, when the patient is able to swallow, a mixture of wine and water, or balm-tea, may be safely administered.

Dr. FRANKLIN suggests to those persons, who are apprehensive of danger from lightning, the propriety of sitting in the middle of a room on one chair, and to lay their feet on another; provided they be not placed beneath a metal lustre suspended from the ceiling by a chain. He farther observes, that it is still safer to fold two or three mattresses or beds in the middle of an apartment, and to place the chairs upon them; for, as the former do not conduct lightning so readily as the wall, the flashes cannot penetrate their substance.—But the most secure place, in his opinion, is a hammock, suspended by silken cords, in the centre of a room.—The curious reader, who wishes to obtain farther information respecting electrical meteors, will be amply gratified, by perusing Dr. FRANKLIN's *Experiments and Observations on Electricity* (4to. 1769, 10s. 6d.); and Dr. PRIESTLEY's *History of Electricity*, 4to. in which this interesting subject is perspicuously treated.

The effects of lightning are frequently not less fatal to vegetable productions. Wheat-plants are peculiarly susceptible of this injury; and Mr. TULL is of opinion, that not only their health is thus greatly impaired, but also their immediate decay, is thereby often occasioned. Such consequences, he observed, were evident from the black spots or patches in a field of corn, especially in those summers which were visited by frequent thunder storms: and he adds, that there is no remedy against this evil.

Forest-trees, in particular, experience similar blasts; and, on sawing them, numerous instances have occurred, in which they were found cracked, split, or otherwise mutilated by lightning.—Dr. DARWIN conjectures that vegetables are affected by this meteor in a manner similar to that, when their succulent shoots are frozen; that is, their vessels burst, as the lightning passes through them, in consequence of its expansive power.

Lignum Vitæ. See Guaiacum.

LILAC, or *Syringa*, L. a genus of exotic plants, natives of Persia, consisting of three species, the principal of which is the *vulgaris*, or Common Lilac. It has long been cultivated in our gardens, on account of its ornamental flowers; and, if properly managed, will grow to the height of 18 or 20 feet.

This shrub thrives on almost any soil, but it produces the most beautiful flowers on rich, light land, though it flourishes best on wet grounds. It is propagated by suckers, which should be separated from the parent plants in the month of October, and set in a nursery, in rows three feet asunder, each sucker being one foot distant from the other. In the second or third year, they may be removed to the spot where they are intended to remain. After this operation, no farther attention will be required, except digging about their roots once in the course of the year, and cutting off the suckers; which not only destroy the beauty of the plant, but likewise deprive it of its nourishment.

The leaves of the Common Lilac are frequented by the Spanish Fly:—the yellowish and red-streaked wood of old trees is valuable to turners and cabinet-makers; as the vessels or utensils manufactured of it, are equal to those made of olive-wood, and almost indestructible: by immersing such articles in a cold dye, consisting of aqua-fortis largely diluted with water, they acquire a fine red colour.—From the flowers of this plant may be distilled an essential oil, similar to that of roses.

LILY, or *Lilium*, L. a genus of exotic plants, consisting of ten species, all of which are remarkable for the beauty of their flowers; but the two following deserve a distinguished place:

1. The *candidum*, or White Lily, which produces a beautiful flower, the fragrant odour of which is so powerful as to induce fainting, if numbers of it be kept over night in a close apartment:—an essential oil may be obtained from them, in a manner similar to that described under the article Jasmine.

2. The *bulbiferum*, or Fire Lily, which also bears fine flowers of a flaming red colour, and which, by culture, sometimes become double.—The Russians and Tungusians eat the roots of this species, either roasted, or boiled in milk; and Dr. Franke informs us (in his *System of Medical Police*, printed a few years since, in German), that these mealy roots might, in times of scarcity, be prepared into wholesome bread.—On account of their emollient and maturating properties, they have been greatly recommended in the dropsy; but are chiefly employed in cataplasms, when boiled, and bruised into a pulp, with oil: in this manner, they are said to form an efficacious application to recent burns.

LILY-OF-THE-VALLEY, or May-Lily, *Convallaria Majalis*, L. an indigenous perennial plant, growing in woods, heaths, and at the foot of hills: it flourishes in the month of May.

This vegetable is eaten by sheep and goats, but refused by cows, horses, and hogs; its flowers are in a high degree fragrant; but, when dried, they acquire a narcotic scent, and, if reduced to powder, excite sneezing. Both the flowers and roots have a bitter taste; and an extract, made from either, possesses similar purgative properties with aloes;—the dose being from 20 to 30 grains.—A beautiful green colour may be prepared from the leaves, with the addition of lime.

LILY, the Water, or *Nymphœa*, L. a genus of plants comprising nine species, two of which are natives of Britain; namely,

1. The *lutea*, Yellow Water-lily, or Watercan; which grows in gentle rivers, pools, and ditches; blows in the months of July and August. When the small yellow flowers begin to fade, the seed returns to the water, in which element it attains to maturity, and again germinates. This aquatic vegetable is eaten by hogs; but goats do not relish its flavour, and it is totally refused by horses, cows, and sheep. The flowers possess an odour similar to that of *brandy*; and the roots, if moistened with milk, are said by Linnæus to destroy crickets and cock-roaches.

2. The *alba*, White Water-lily, Candock, or Water-socks, which grows in ponds and slow rivers; flowers in the month of July. This species is one of the most beautiful British plants, and may be propagated by transplanting its bulbous roots in the winter.—It is eaten by hogs, but disliked by goats, and totally rejected by cows and horses.—The roots are employed in Ireland, and the Island of Jura, for dyeing a dark brown colour; but the Egyptians eat them boiled, and convert the seeds into bread. The Swedes also, in prevailing dearth, have used the root of this plant as a substitute for corn; though it requires to be previously divested of its bitter taste, by frequent ablutions.

According to Gleditsch, the roots of the white and yellow lily are equally useful in tanning and currying.

LIME, a white, soft, friable substance prepared of marble, chalk, or other calcareous earth, by burning them in a kiln. The chief uses of lime are,

1. As an ingredient in mortar to *cement* brick or stone-buildings; for which purpose, being divested of its humidity, and its pores being at the same time opened by the action of the fire, it is so eminently calculated, that it may be easily reduced to powder, and mixed with sand or other matters.—See Mortar.

2. As a *manure*, it is of the most extensive utility: we shall, therefore, concisely state the properties of the best limestone, as well as the proportionate quantities in which it is to be spread on lands; and at the same time point out those soils that are really ameliorated, and likewise such as receive no benefit from its application.

Formerly an opinion generally prevailed, that the most efficacious lime for manuring lands, was produced from the hardest calcareous stones, which most intimately approached the nature of marble: modern experience, however, has amply refuted this supposition.—It appears, indeed, that there are two sorts; namely, *magnesian* and *calcareous* limestone; the latter of which is attended with the most beneficial consequences, while the former is highly injurious to *land*. This remarkable fact was first published by S. Tennant, Esq. in the "*Philosophical Transactions of the Royal Society*," for 1799; who, being informed of the opposite nature of the two species, made various experiments, in which their respective properties were clearly ascertained.

The barren, or magnesian lime, is found in various parts of England, but especially in the county of Nottingham, where a quarry of it is worked to the extent of 30 or 40 miles; also in the counties of Derby and Northumberland, in the latter of which it is known by the characteristic name of *hot*, in contradistinction to the *mild*, or calcareous lime, that abounds in all parts of Britain. We regret that we cannot enter into a detail respecting Mr. TENNANT's important discovery; the particulars of which are recorded in the volume above mentioned.—The magnesian lime may be farther distinguished from that made of pure calcareous stone, by its slow and difficult solution in acids.

The hardness or softness of limestone, however, is of no importance, provided it be pure, that is, free from sand, clay, or other substances, which render the mass less fertilizing.—When the stone is dug out of the earth, it should be conveyed to a kiln, into which coals or turf must be put in alternate layers with the lime-stone, and the latter thoroughly calcined.—With respect to the length of time the materials should be exposed to the fire, it has been found by experiment, that lime burnt in *four* hours, has a much greater disposition to recover its fixed air from the atmosphere, than that which has been burning for the space of *twenty-four* hours; and, as the excellence of this manure is supposed to depend on its re-attraction of fixed air, the process of calcination ought to be regulated accordingly.

In this state, it is called *quick-lime*, and should be spread as speedily as possible, immediately before the plough; so that the greater part may be slacked in the soil. The proportion used, depends much on the custom of the country; but should more properly be adapted to the nature of the land. In the county of York, *thirty-six* bushels only are carted on an acre; in Wales, a quantity somewhat larger; in Ireland, from *five* to *six hundred* bushels are spread on every English statute acre; and in various parts of England, very small portions are injudiciously scattered: for it is the opinion of the most experienced agriculturists, that *three* or *four hundred* bushels at the least (if the price be not too high) should be allowed to each acre; especially when the soil has long been in an uncultivated state. One *good liming* is, in such cases, decidedly preferable to small quantities frequently repeated.

In common situations, however, where the land does not abound in putrescible matters, and is not vitiated by acids, Mr. YOUNG is of opinion, that 160 bushels per acre, will produce a considerable effect; but, on stiff strong clays, he thinks at least double, or triple, that quantity ought to be allowed.

If lime be applied without any other manure, it is said to exhaust the most fertile particles of the soil. Some agriculturists, therefore, suggest the propriety of forming small heaps, and covering them with earth; as soon as the soil has, by its moisture, slacked the lime, the heaps are to be opened, and as much dung buried in each as the earth will cover. A more economical and judicious method, is that stated by Mr. ANDREWS, in the

4th vol. of *Annals of Agriculture*. He directs about 140 loads (each containing 40 bushels), of moist dung to be heaped up in the month of December, when 200 bushels of lime are to be well incorporated. The whole is then suffered to lie for three months, after which the heap is to be well stirred: when the harvest is completed, the compost is to be spread on a pea-stubble, and ploughed in for barley; but, if the season should not favour the purpose, he directs these labours to be performed after the first frost that occurs. Mr. ANDREWS farther observes that, in consequence of such management, his barley-crops have, upon an average of twelve years, amounted annually to four quarters and six bushels per acre.

The advantages arising from this treatment, are, 1. The total destruction of the seeds of weeds, so that the land on which this mixture had been spread, was uniformly the clearest: and, 2. The increased fermentation of the dung, by which its fertilizing properties are more speedily excited. Lastly, the expence of the lime was to him 10s. per acre; and its beneficial effects continued for four years.

The soils peculiarly susceptible of improvement, by means of lime, are:

1. Rich black or brown friable crumbling loams, which abound with vegetable matter: its general putrescency being accelerated by the lime, such land is so greatly meliorated as to yield crops, which they could never have produced by the application of any other manure.

2. On low, rich, drained meadows, that have formerly been bogs, and the black soil of which abounds with vegetable fibres.

3. On old sheep-walks, heaths, and commons, which have been under grass for time immemorial, and are first to be converted into arable land; but lime will not be of any advantage, after they have been cultivated for several years. And, though such manure will produce favourable effects upon old *lay* soils, abounding in vegetable particles, yet when the latter are putrefied by *liming*, and exhausted by repeated *cropping*, it will be of no service.

4. On moory, boggy, mountainous land; and, according to Dr. HUNTER, on black peat-earth. In his opinion, lime prevents the spontaneous growth of heath, and produces a new family of vegetables, especially white clover. He farther remarks, that the greatest improvements ever made on moors, in any country, have probably been effected by means of lime.—There prevails, however, a diversity of opinion on this subject, which we are unable to reconcile.—In the 16th vol. of the *Transactions of the Society for the Encouragement of Arts*, &c. THOMAS DAVIS, Esq. (steward to the Marquis of BATH), states that, though lime is the only proper manure for such soil, which is thus qualified to produce crops of corn for the first 3 or 4 years, after converting it into arable or meadow land; yet this manure loses its ameliorating properties in the course of ten years; and he never found a second liming to be productive of any beneficial effect.

5. On all other waste soils that have been over-run for ages with furze, heath, broom, fern, bushes,

or wood; and which, though richly stored with vegetable food, have contracted an acidity, in consequence of their long rest, and the spontaneous growth of roots.

On the contrary, lime is of little service on poor, light, and thin soils; or such as are on a quarry of lime or other stone, especially after they have borne crops for a considerable number of years. Nor is it productive of any advantage on strong, stony land; on wet, cold loams, which have not been sufficiently drained; or similar clays that are tenacious of moisture; but Mr. ARTHUR YOUNG is of opinion, that large quantities of *well-drained* lime, laid on very stiff clay, would be attended with a favourable effect; though he candidly adds, that it never has been tried to his satisfaction.

With respect to the expence of procuring lime, the usual cost is from 2½d. to 3d. per bushel, where coals can be easily conveyed to the kiln. But, where fuel is expensive, and at a distance, the price rises to 4d. and sometimes even to 6d.: in this case, however, it is too valuable to be employed as a manure, unless it be ascertained by experience, that a small proportion will answer the purpose. Mr. YOUNG observes, that "a man may venture large quantities at 3d. per bushel;" though even at that price, he would employ it only on those soils which might, in all probability, be thus greatly and permanently improved.

Few manures contribute to promote vegetation in a more conspicuous manner than lime. By its union with the carbonic acid, it renders the latter soluble in water, instead of expanding it into a gas; and thus a great quantity of carbon will be absorbed by the vessels of plants. Dr. DARWIN conjectures, that calcareous matter forwards vegetation by the phosphorus it contains; and which, being united with the lime, is converted into a hepar, without becoming acid by the addition of *oxygen.* Although lime be an improper manure for clay-soils, Dr. D. is inclined to believe, that if it were properly mixed with them, such lands would be rendered less cohesive, and consequently admit of being more easily penetrated by vegetable fibres. It destroys worms, snails, and all other insects, which may be touched by it, and with which almost every soil abounds. Lastly, such are its ameliorating effects on grass-land in particular, that if a spadeful of lime be thrown on a tussock, which horses or cattle have refused to eat for several years, they will for many succeeding seasons eat it close to the ground: this change, Dr. DARWIN supposes to arise from a larger portion of saccharine matter being now contained in the joints of the grass, and a smaller degree of acidity in its circulating juices.

Quick-lime is also of great utility in rending rocks and stones, when mixed with gunpowder, in the proportion of one pound of the former, well dried and pulverized, to two pounds of the latter. This singular property of lime was discovered, and is related, by H. D. GRIFFITH, Esq. in the 8th vol. of the *Transactions of the Bath and West of England Society*; where he states, that the mixture above specified, caused an explosion with a force equal to *three pounds* of gunpowder: hence, in those operations, one-third of the expence may be saved.

As a medicine, lime is of considerable use; and has lately been employed with success in the fevers of America. It is, however, chiefly prescribed in a state of solution, when it is called *lime-water*. This fluid is prepared by gradually mixing half a pound of new quick-lime with twelve pints of boiling distilled water. The whole is suffered to stand in a covered vessel for one hour, when it is poured off, and preserved in close bottles.—Lime-water was formerly in great repute as a solvent of the stone, and a remedy in scrophulous affections. It has likewise been used both externally and internally for cutaneous eruptions; though we by no means approve of its indiscriminate use, which may be attended with dangerous effects.—On account of its astringent properties, this preparation has also been successfully prescribed in cases of *diabetes*, or immoderate flow of urine; and other disorders proceeding from laxity or weakness of the solids. At present, it is chiefly used for washing foul or ill-conditioned ulcers.

Notwithstanding these useful qualities of *lime*, it is, if accidentally swallowed, or inhaled in any quantity, one of the most fatal *poisons*. Hence, persons employed in lime-works become subject to blood-spitting, asthma, painful constipations of the bowels, and consumption: their countenance turns unnaturally pale; and, after languishing for years, these unhappy victims die in a sleepless state. — *Bread* adulterated with lime, absorbs all those juices of the stomach, which ought to promote digestion; obstructs the alimentary canal; occasions almost constant thirst; and at length produces the most violent colics, fevers and death. As soon, therefore, as it may be discovered, that a person has taken into the stomach either *lime* or *gypsum*, the first step will be to administer an emetic, consisting of 1½ or 2 ounces of vinegar of squills, and 20 or 30 grains of ipecacuanha in powder: large draughts of sour whey should next be given, to facilitate the operation of the medicine. In order to counteract the causticity of lime in the stomach and intestines, it will be advisable to drink, alternately, a mixture of vinegar and water, lemonade, or similar acidulated beverage, for one day; and, on the other, to make use of mucilaginous decoctions, such as barley or rice-water, gruel, fat broths, oils, or sweet whey in which a small quantity of white soap has been dissolved; to eat salads with a large proportion of oil and vinegar, and ripe sub-acid fruit. To complete the cure, it will perhaps be requisite to administer, according to circumstances, emollient or laxative clysters.

LIME-GRASS, or *Elymus*, L. a genus of plants comprising twelve species, three of which are natives of Britain: the principal of these is the *arenarius*, or Upright Sea Lime-grass, which grows on the sea coast, and flowers in the months of July and August.—It is eaten by cows, horses, and goats, but refused by sheep;—Dr. WITHERING questions whether it may not be advantageously formed into ropes, in the same manner as the Tough Feather-grass (*Stipa tenacissima*, L.), is manufactured in Spain.—This plant is of essential service on the coast, for preventing the encroachment of the sea, in which respect it saves millions of florins to the Dutch, who cultivate it with great industry.—Its mealy seeds and roots have, in times of scarcity, been converted into bread; and the grass itself, while young, affords proper food for cattle.

LIMES, the fruit of a variety of the Citron-tree (which see); growing abundantly in Jamaica, and other warm climates: it is the smallest production of the kind; has scarcely any pulp; but contains a very sour juice, of a yellow greenish colour. On account of its strong acid, it is by the West Indians generally used as an ingredient in punch; though it is frequently productive of the most alarming colics, especially the *dry belly-ach*, of the cure of which we have already treated, p. 76, under the article LEAD.

The inspissated juice of limes possesses a fine flavour; but, as it is one of the most corrosive acids, which is not suffered naturally to arrive at maturity, we cannot recommend it for its salubrity. Nevertheless, the negroes in the West Indies employ this fruit with singular success for the cure of "scorbutic swellings of the legs, and stains of the skin, merely by rubbing the affected legs, knees, and hams, three or four times a day, with a fresh-cut lime." The same remedy is used in Jamaica, for mitigating those violent pains in the bones, which precede the disorder called the *yaws*.

LIME-TREE, or *Tilia*, L. a genus of trees consisting of seven species; the principal of which is the *Europæa*, Common Lime-tree, or Linden-tree, growing in woods and hedges; flowering in the month of July.—In a rich soil, it attains a prodigious size, being sometimes 20 feet in circumference, but frequently hollow: there are instances of lime-trees having survived 800 years, in different parts of Germany.

The linden-tree is erroneously supposed to be a native of Britain; for, according to Mr. PENNANT, it was imported into England previously to the year 1652.—The blossoms of this tree are of a whitish colour, possess a fragrant smell, and supply the bees with the best honey. Whether fresh or dry, they easily ferment, and MARGGRAF distilled from them a very fine-flavoured brandy.—The wood is soft, light, and smooth; close-grained, and not easily subject to be infested by the worm, if kept in dry places. It is used for making leather-cutters' boards, for carved work, and likewise for turnery-ware.—The leaves may be dried, and preserved as winter fodder, being eagerly eaten by sheep and goats. Cows also relish them in the autumn, but their milk thus acquires a very unpleasant taste.—Excellent ropes are made of the inner-bark on the Continent, and which do not soil the linen suspended on them for drying: from the same substance the Russians manufacture mats, shoes, and other rustic garments. Linden cordage is so remarkably strong and elastic, that in this respect it is superior to iron chains.

The lime-tree is remarkable for the excrescences, or *galls*, which appear on the edges of its leaves during the spring: they are of an oblong irregular shape; of a reddish colour, and occasioned by a worm that inhabits them while alive, and which was first discovered by REAUMUR. These animo-vegetable productions being very numerous, he was of opinion that they might be advantageously employed in dyeing: and, to ascertain their properties, he made various experiments, by rubbing the galls on linen, to which they imparted a beautiful red colour that was not discharged, though it had been washed two or three times.—Hence, it is highly probable that *lime-galls* may be rendered valuable in the art of dyeing; and a considerable expence, which is at present incurred by the importation of cochineal, and similar drugs, might thus be saved.

This useful tree farther contains a mucilaginous juice, which, by repeated boiling and clarification, produces a substance similar to sugar: we conceive it may be extracted from it in the manner already stated, vol. i. p. 260, under the article Birch-tree.

The wood of the lime-tree, though affording an indifferent fuel, may be converted into excellent charcoal for drawing, and for the manufacture of gunpowder. From the external bark, Ruger prepared a fine rose-coloured lake. Both the bark and leaves afford materials for a coarse, but smooth, brown paper, of a reddish cast: and that manufactured of the former, is peculiarly well calculated for drawings.—The seeds yield, on expression, a sweet and agreeable oil, similar to that which is found in ripe cocoa-nuts; and is of equal service as an ingredient in chocolate.

LINE, for *angling*, a series of threads, or horse-hairs, twisted together, suspended on a rod, and furnished at the end with a hook for catching fish.

The best material for making lines, is horse-hair, which should be uniformly twisted, as its strength will thus be considerably increased. Silk is also occasionally employed; but it is by no means equal to hair. The best colours for lines are, sorel for turbid waters, and white, or grey, for clear streams.—A light green tinge may be imparted to fishing-lines, by immersing the hair in a liquor prepared of alum, soot, and walnut-leaves boiled together.

LINEN, a well known kind of cloth, made chiefly of Hemp and Flax.—Having already described the different processes which these substances undergo, before they are converted into cloth, we shall at present add only such facts, as may tend to render our former statement more satisfactory.—After the filaments have been properly dressed and combed (see vol. ii. p. 302), the flax is spun into the yarn by the hand, in the usual manner; instead, however, of moistening the threads with spittle, or common water, we would recommend the mucilage prepared from the Common Comfrey (which see) to be preferably employed. By such simple means, the saliva, so useful in the process of digestion, may not only be saved, but the yarn will be totally divested of its brittleness, and, in other respects, considerably improved. Next, the yarn is conveyed to the loom, where it is woven into cloth (a process similar to that practised with wool, and described under the article Cloth, vol. ii.); after which it is bleached, in the manner stated under that head, in our first volume.

Linen is more difficult to be dyed of a *black colour*, than either wool or cotton. The black, imparted to it by means of green vitriol and galls, soon disappears by washing. It is, therefore, a desideratum of considerable importance, to procure such a preparation as will strike a beautiful, deep, and permanent black: for this purpose, we subjoin the following account, by M. Vogler, of Weilburg. One quart of pure, soft water, is to be mixed in a large bottle, with two ounces, or two ounces and a half of common aquafortis; to which a similar quantity of litharge should be gradually added: the bottle, after being slightly corked, must be kept in a warm place, and occasionally shaken. In the course of a few days, the liquid may be poured into a deep earthen, leaden, or pewter vessel; when the linen intended to be dyed, should be well washed (though not bleached), and immersed in it for ten or twelve hours. It is then to be taken out, and, after being washed and rinsed three times in pure cold water, it ought to be dipped in a weak solution of common glue; again rinsed, and then placed in the shade to dry.

Three quarters of an ounce of galls, well bruised, are now to be boiled in a quart of rain, or other pure, soft water, for eight or ten minutes, when a similar quantity of common salt is to be added; and, as soon as the latter is dissolved, the linen should be boiled in the liquor for seven or eight minutes; then taken out, washed, wrung three times as before, and dried in the shade. By these operations, the stuff will imbibe a dark grey-yellowish tinge, that disposes it for the better reception of the colour.

Three quarters of an ounce of copperas, or vitriol of iron, and a similar quantity of common salt, are now to be dissolved in a quart of pure, hot water, and the linen immersed in the liquid for eight or ten hours; when it must again be washed, rinsed, and suspended for drying in the shade.

In order to strike the black colour, M. Vogler next directs three quarters of an ounce of logwood to be boiled for seven or eight minutes, in somewhat more than two quarts of rain or river water, when a quarter of an ounce of white starch should be added, having previously been mixed with a small quantity of fresh water, to prevent the rising of lumps. As soon as this is perfectly dissolved, the stuff ought to be boiled in the liquor for seven or eight minutes, after which it must undergo the same treatment as has been repeatedly specified.

The linen will thus acquire a fine black tinge; but, if the dye be not sufficiently deep, it may again be immersed in the decoction of logwood, and treated in the manner above stated, till the requisite shade be obtained. But as the stuff, in this state, will not admit of being washed in ley, or soap-water, without losing its colour, M. Vogler farther directs it to be dipped in a cold solution, prepared by boiling an ounce of galls, well bruised, for seven or eight minutes, in a quart of the glue-water, in which an ounce of copperas should then be dissolved. After the linen has remained one hour in this liquor, it must be pressed and dried in the shade: in consequence of these processes, it will acquire a beautiful and permanent black colour.

A durable, but expensive, *purple dye* may be communicated to linen, by immersing it in a solution of gold, in aqua-regia.—For this purpose, the latter ought to be fully saturated with the metal, and be diluted with a triple quantity of water: if a deep colour be required,

quired, the piece, when dry, must be repeatedly steeped in it; and as the tinge frequently does not appear for several days, the stuff should be exposed to the sun or free air, and be occasionally removed to a damp place, or moistened with water.

Various patents have been granted for different processes relative to the bleaching, &c. of linen cloths. Several of these have already been noticed under the articles BLEACHING, CLOTH, &c.: we shall, therefore, mention only a few others, to render our account more complete.

Among these are, 1. Mr. TENNANT's, in 1799, for preparing the oxygenated muriates of calcareous earths, &c.; in a dry form, and applying them to bleaching, &c. 2. Mr. GILLESPIE's, in the same year, for a new mode of printing linens, &c.; 3. Mr. FODEN's, in 1800, for a crystalline size, for dressing linen, &c. The reader will find an account of these in the later volumes of the *Repertory of Arts*, &c. where diffuse specifications are inserted.

As various frauds are often committed by unprincipled persons, who erase the marks or initials, made on linen with silk, we think it will be useful to communicate the following recipe, which was recommended by the late Dr. SMELLIE:—He directs about half an ounce of vermilion, and two drams of the salt of steel, to be finely levigated with linseed-oil; the thickness or limpidity of which may be varied as occasion may require. This preparation for marking linen is stated to be equal, if not superior, to the various compositions vended in the shops; and it perfectly resists the effects both of acids, and of alkaline leys.

Lastly, we cannot conclude this article, without recommending the strictest care to be taken in avoiding the use of *damp linen*, in any form whatever; as we are convinced that many, by neglecting this simple precaution, have met with a premature dissolution. And, if some regulations were made respecting inn-keepers, as far as relates to this subject, catarrhs, and various other diseases, would frequently be prevented.

LING. See HEATH.

LINIMENT, in Pharmacy, a composition, the consistence of which is of an intermediate nature, between unguents and oils: it is employed for anointing different parts of the body.—The common preparations of this kind are:

1. The *simple liniment*; which consists of four parts of olive-oil, and one part of white wax: the whole is gradually incorporated, till it acquire a due consistence. It is chiefly used for softening the skin, and healing chaps; for which purpose, however, honey-water, in general, is more efficacious.

2. The *liniment of ammonia*; which is prepared by simply shaking equal proportions of the water of ammonia and olive-oil in a phial, till the whole is thoroughly mixed.—This compound is of great service in inflammatory quinsies; for a piece of flannel, moistened with it, and applied to the throat every third or fourth hour, frequently carries off, or at least diminishes, the violence of the inflammation.

3. *Lime-water Liniment*; which consists of equal parts of lime-water and linseed-oil, properly incorporated. It is very useful in scalds or burns, and if timely applied, effectually prevents the inflammation which generally takes place in such cases.

4. The *anodyne liniment,* or *balsam*; is prepared by digesting one dram of opium, and half an ounce of Castile soap in four ounces of rectified spirit of wine, for the space of three days; then adding two drams of camphor, and half a dram of distilled oil of rosemary: the vessel should be agitated, that the various ingredients may be properly mixed.—This composition is frequently employed with success, for mitigating the pains arising from sprained limbs, and similar local affections.

LINNET, or *Fringilla linota,* L. is a very elegant bird, of which there are several varieties: it is of a small size, and a greyish-brown colour; the lower part of its breast is tinged with a fine blood-red spot, which disappears in the moulting season, and again becomes visible in the spring.

Linnets are deservedly esteemed for their song: the female constructs her nest in hedges and furze-bushes on heaths; deposits five whitish eggs, spotted similar to those of gold-finches; and broods three or four times in the year.

With a view of teaching linnets to whistle tunes, or to imitate the notes of any other bird, they should be taken from the parent bird, when only between four and ten days old. If removed at this early age, they may without difficulty be taught to modulate their voice, and strike melodious notes, being remarkably docile birds. While young, they should be fed with equal parts of bread and rape-seed, bruised and boiled together, which may be given them several tines a day, properly moistened; but this mixture must neither be suffered to become sour, nor dry or stiff; as, in the former state, it will gripe and destroy them; in the latter, it renders them costive, and thus proves alike fatal.

Linnets are peculiarly fond of linseed, or the fruit of the flax-plant, which they divest of its husk or shell, before it is swallowed. But it deserves to be remarked, that linseed, if allowed them unmixed with rape-seed, bread, canary-seed, &c. is detrimental to their health, and, in a few weeks or months, proves destructive.

It has been attempted to teach linnets to pronounce words like parrots; and they have sometimes, though with considerable trouble, acquired the art of speaking in a manner more pleasing to children than adults.

LINSEED, or LINTSEED, is the fruit of the Flax-plant, or *Linum,* L. from the stalks of which, linen, cambric, and other sorts of cloth are manufactured.

According to the most experienced cultivators of flax, the excellence of the seed depends upon its weight, and the brightness of its colour. But, though such marks of distinguishing old from fresh, or heavy from light linseed, may be sufficiently accurate for the purpose of expressing the oil, yet they do not afford a satisfactory criterion, in selecting the most proper seed for the culture of this valuable plant. Hence, a handful of linseed should be thrown into a glass of water; and, if the whole or greater part of the grains in a few minutes sink to the bottom, such seed will be fit for sowing: or, by putting a small quantity of them in a silver spoon, and holding it over a moderate fire, all the grains that contain the germinating principle, will speedily escape. But the most certain method of determining their vegetating property is the following:—Mix three parts of earth with one part of slacked lime; scatter a certain number of grains over this compost, moisten it with a little water, and attentively observe whether, in the course of 16 or 18 hours, all the grains have commenced to germinate. As lime uncommonly promotes the process of sprouting, it may be fairly concluded, that such of the seeds as evince no disposition to swell, within the time above stated, are unfit for being committed to the ground.—See farther, FLAX.

Linseed may be advantageously employed for the feeding of cattle, both when the oil is expressed, and also by boiling it into a jelly, as directed p. 463, of our first volume.

These seeds are esteemed for their emollient and anodyne virtues; they are used externally in cataplasms, to mitigate the pain of inflamed tumors. Internally, a weak infusion of them, by way of tea, is recommended in coughs, as an excellent pectoral, and as being very serviceable in pleurisies, nephritic complaints, and suppressions of urine.—Linseed has likewise been employed in Asia, and, during times of scarcity, in Europe, as food; but it furnishes neither an agreeable nor wholesome aliment.

LINT, in surgery, signifies linen scraped so as to form a soft woolly substance, which is employed in dressing wounds. It is made into various forms, denominated according to the shape of which they consist. Thus, if it be oval, it is called a *pledget*; and, if cylindrical, it is termed a *dossil*.

The purposes to which lint is applied, are, 1. To prevent the flow of blood in fresh wounds, by filling them with this absorbent substance, before a bandage can be applied; 2. To promote the healing of wounds, especially when spread with some digestive ointment, or balsam; 3. For drying wounds and ulcers; 4. To keep them open, in order that the lips may not close before the interior part is perfectly healed; and, lastly, to preserve wounds from the hurtful influence of the air.—Trifling as lint may appear, it is an article of considerable utility, and with which every family should always be provided, to serve in case of sudden emergency.

LION'S-TAIL. See MOTHERWORT.

LIPS, in anatomy, are the exterior edges or extremities of the mouth.

Lips are subject to few disorders deserving notice, excepting that called the *Hare-lip*, in which the upper part of the mouth is cleft, or slit, in a manner similar to that of a hare.—If the division be so large that a piece appear to be wanting, no art can supply the deficiency; but, in slighter cases, the skin may be removed from the edges of the fissure, and the whole brought in contact, by means of a needle and waxed thread; after which the external part is dressed with balsam of Peru, or some similar vulnerary unguent. With proper care, the wound heals in a few days, when the bandages may be removed, and a slight scar only will remain. During the whole course of the operation, the patient must carefully avoid all motion of the part affected; his diet ought to be mild and nourishing, lest the wound be irritated, and an inflammation induced.

Chapped, or sore *lips*, may be healed by the frequent application of honey-water, and protecting them from the influence of cold air.

LIQUOR, a general name for any liquid preparation, but more particularly applied to such as are either fermented, or distilled: of the former class are, beer, ale, wine, &c.; of the latter, are brandy, gin, rum, and other ardent spirits.

A patent was granted, in 1797, to Mr. JOSEPH BRAMAH, for his invention of certain new methods of retaining, clarifying, preserving, and drawing off every kind of liquor; and more particularly porter, ale, &c. together with various improved casks and implements necessary for giving his contrivance full effect.

Our limits will not permit us to specify the different means employed by the ingenious patentee: we shall, therefore, at present, only state the various objects effected by his contrivance.

1. To preserve all liquors, used as beverage, from flatness or acidity, while they are *on tap*, for any period of time; by which the expensive custom of bottling liquors may be entirely superseded.

2. To render water, and every other fluid perfectly pellucid, and to extricate it completely from all heterogeneous matters, by means of a forced filtration, without the aid of isinglass, or any other chemical preparation, known under the name of *finings*; and which is usually employed for the purpose of clarification.

3. To convey every kind of liquor through small tubes from the cellar to any part of the house; by which means the cellar-door may be fastened at all times, and thus secured from the injurious access of either cold or heat; while intoxication, adulteration, embezzlement, &c. will be effectually prevented.

Lastly, to secure and draw off liquors, as occasion may require, by means of cocks constructed on a new principle, so that no person can open them, excepting such as have permission to that effect. Thus every person may ascertain, with accuracy, the quantity of beer, ale, &c. consumed.—To publicans, in particular, this invention must be a very great acquisition; as, beside the frauds committed on them by indolent or dishonest servants, considerable quantities of liquor will be saved, that are otherwise inevitably wasted by careless drawing, &c. The reader who wishes to obtain farther information respecting Mr. BRAMAH's useful inventions, will find them described in the 9th volume of the *Repertory of Arts*, &c. where his patent is illustrated with engravings.

LIQUORICE, or *Glycyrrhiza*, L. a genus of exotic plants, comprising two species, the principal of which is the *glabra*, or Common Liquorice. Its long, thick, creeping roots strike several feet deep in the ground; the stalk often attains the height of five feet, and the red or blue flowers appear between the mucilaginous leaves, in the month of July.

This plant is propagated by cuttings of the fibres that issue from the parent-root, near the surface of the earth: they should be divided into sets of six or eight inches in length, each having, at least, one good bud or eye, and planted in February, or in the beginning of March. A light, sandy, and very deep soil should be selected, well manured, and dug three spades deep.—The sets ought to be put in the ground by means of a line and dibble, at the distance of 12 inches, in rows, with their tops about an inch under the surface; and the rows should be a foot and a half distant from each other.

In three years after planting, the roots of the liquorice will be sufficiently large, and may be taken up between the months of November and February; for this operation should neither be commenced before the stalks are fully decayed, nor delayed till late in spring; in which latter case, the roots are apt to shrivel and diminish in weight. Hence, it is advisable to sell them almost immediately after they are removed from the field. They are vended to the druggists at from 20s. to 30s. or 40s. per cwt.; and an acre of good land produces 3000 roots and upwards; so that the produce has sometimes exceeded 60l.

The common liquorice is cultivated in most countries of Europe, for the sake of its sweet mucilaginous root: but that of British growth is preferable to the foreign, which is generally mouldy when it arrives; as this vegetable, unless preserved in a dry place, is remarkably liable to such corruption.—In order to extract the juice, the Italians first cut the root in pieces, then moisten and crush it in a mill; thus it is formed into a mass similar to dough, which is boiled for eight hours, and occasionally supplied with water. Next, it is twice pressed, so that all the mucilage may be completely separated: in this state it is slowly evaporated in another cauldron for twenty-four hours, or such time as is required to reduce it to a proper consistence. When cool, it is cut into cakes, either of a square or cylindrical form, and packed in chests with bay-leaves.

The powder of liquorice, usually sold, is often adulterated with flour, and probably also with articles less wholesome: the best sort is of a brownish-yellow, of a very rich sweet taste, and more grateful than that of the fresh root. As this vegetable is one of the few sweet substances tending to allay thirst, it was employed by GALEN in dropsical cases, with a mistaken view to prevent the necessity of drinking. There is, however, no doubt of its gently detergent qualities, which render it an excellent medicine in coughs, hoarseness, asthma, &c.; for lubricating the throat, softening acrimonious humours, and affording relief to the organs of respiration. But, with this intention, it ought to be taken as a diet-drink, in considerable portions, by way of infusion; while the patient should abstain from tea, and other hot liquids, which only inundate the stomach, and aggravate the complaint.

In domestic economy, the sound roots of the liquorice may be employed as stopples for beer or wine-bottles, being more wholesome and durable than those made of cork.—BÖHMER informs us, that sour ale or beer may be completely restored, by suspending in the cask a linen bag containing liquorice-powder, with a small portion of chalk and pot-ash. This assertion is strongly supported by the account of TOWNSEND; who, in the 2d volume of his *Travels through Spain*, observes, that of the 200 tons weight of liquorice, or *Spanish Juice*, annually produced in that kingdom, a considerable part is imported into

London, for the use of our porter-breweries.

Liquorice-vetch. See Milk-vetch.

LITERARY PROPERTY, is that right which an author justly claims in his original literary compositions; so that no person may, without his permission, either publish the work, or receive any profit from the printed copies.

The question relative to literary property has only within these few years been conclusively settled.—The late Dr. Johnson was of opinion, that the bookseller, or he who purchases the copy-right of a book, acquires the sole right of printing it, and of selling the copies printed in conformity to the manuscript: but, at the same time, such purchaser has no right either to make any additions to, or to expunge any part from, the work, without previously obtaining the author's permission, who still preserves an interest in the performance. The Doctor farther maintained, that abridgements were strictly legal, however the property of the purchaser, or the reputation of the author, may be affected; because every work, that comes into the possession of a reader, is liable to be examined, confuted, censured, translated, and abridged.

The right of *abridging books* is, therefore, established both by reason and the customs of trade.—Independently of the copy-right naturally inherent by our common law, the statute 8 Ann, c. 19, declares the whole liberty of printing and re-printing a work, to be vested in an author, and his assigns, for the term of *fourteen years,* and no longer: such property is also protected by additional penalties and forfeitures.—By the same statute it is farther enacted, that if an author be living at the expiration of that period, his original interest shall revert to him for a similar term of years.—The 8 Geo. II. c. 13, and 7 Geo. III. c. 38, have judiciously extended the same privilege to the inventors of prints, and engravings, for the space of *twenty-eight* years.

LITHARGE, or *Lithargyrum,* a preparation of lead, consisting of soft flakes of a yellowish or reddish colour. It is obtained by exposing calcined lead to a brisk fire, sufficiently strong to melt it into an oil; which, on cooling, concretes into a flaky matter. Thus, according to the different degrees of heat, it assumes a pale or deep red colour: the former is generally called *litharge of silver*; and the latter, *litharge of gold.*

This preparation is of extensive utility for roasting gold, silver, or copper ores, as it liquefies all earthy and extraneous matters into glass, and thus the metal is more easily separated. Litharge is also employed by potters, for glazing their wares (though such vessels are unwholesome, see vol. ii. p. 377); and likewise in the composition of certain glasses; because it is not only fusible in itself, but contributes to the fusion of other substances.—Lastly, it may be revived into lead: and thus considerable quantities, which are produced by refining metals, are again converted into their original form, by melting them upon burning coals.

Litharge-plaster is prepared by boiling two parts of olive-oil with one part of litharge, over a moderate fire; adding water, and constantly stirring the mixture, till the two former are duly incorporated.—This composition, which was formerly called *Diachylon*, is usually applied in excoriations of the skin, slight wounds, &c. Its action is so far beneficial, as it keeps the injured part soft and somewhat warm, while it excludes the external air; though such plaster ought to be employed with due caution.

Lithontriptics. See Stone.

Live-for-ever. See Cudweed.

LIVER, the largest and most ponderous of the abdominal viscera, which, in adults, weighs about 3lb. It is situated under, and connected with the diaphragm, by means of the suspensory and other ligaments; extends over the right side of the stomach, and serves to purify the blood, by secreting the bile.

The liver of animals affords neither wholesome nor palatable food. The blood-vessels and biliary matters connected with this organ, render it still more objectionable, especially to plethoric persons. From its dry and earthy nature, it corrupts the chyle, and obstructs the vessels: hence it requires a great quantity of drink, and ought to be eaten only by the robust, whose powers of digestion are unimpaired.

Obstruction of the Liver, a disease in which the blood is apt to stagnate, and form congestions in that viscus.—Its symptoms are, difficulty of breathing, an irregular heat in the whole body, dry cough, loss of appetite, and a straightness about the region of the heart: the urine is at first thin and limpid; but, as the hectic fever increases, it assumes a deep orange-colour, and, at length, deposits a thick sediment. This complaint chiefly affects persons of sedentary occupations, or those whose natural discharges are suddenly obstructed, and such as use too gross a diet, or indulge in too long repose on feather-beds.

Cure: Blisters applied to the region of the liver; emetics; mercury, used both externally and internally.—Considerable benefit has also been derived from the use of gum ammoniac, in the form of an ointment, with oxymel of squills, and the application of emollient clysters; from the extract of the Common Hemlock, prescribed according to circumstances, and likewise from the Bath-waters.—The patient's diet should be light and nourishing.

Inflammation of the Liver, or *Hepatitis*, a most dangerous and frequent disorder in hot climates: it is accompanied with tension and pain in the right side, under the false ribs; a difficulty of breathing, and lying on the left side; dry cough, vomiting, hiccough, and loathing of food.

The more immediate causes of this affection are, indurations, or hard tumors of the liver; too great fatness in the *omentum* or caul; sudden exposure to cold air, or the drinking of cold water, when the body is over-heated; violent concussions occasioned by too powerful emetics, &c.

In this, as in other inflammations of the viscera, recourse must be first had to blood-letting, which should be repeated according to the nature of the case; a blister is then to be applied to the part affected; mercurial purgatives, together with emollient and attenuating clysters, are next to be administered. The abdomen and legs ought also to be frequently bathed in warm water.—Lately, the nitrous acid, largely diluted with water and mucilage, or syrup, has proved almost a specific in chronical affections of the liver, in the East Indies; but this medicine cannot safely be taken, without medical advice. The diet and regimen to be observed by such patients, we have already stated (p. 12) under the article INFLAMMATORY FEVER.

LIVERWORT, or *Lichen*, L. a genus of perennial plants, comprising 363 species, the greater number of which are natives of Britain:—the most remarkable of these are:

1. The *calcareus*, Calcareous, or Black-nobbed Dyers' Liverwort, which grows on lime-stone rocks in the North of England and Wales, and is in flower from July to December.—This species is so peculiar to lime-stone rocks, that, wherever these are found among other soils, they may immediately be distinguished by the appearance of this plant.—When dried, pulverized, and steeped in urine, the calcareous liverwort is employed by the Welsh, and by the inhabitants of the Orkney Islands, for dyeing a brilliant scarlet colour. It should be gathered in August, completely dried, then reduced to powder, and steeped in urine for three weeks, in a close vessel.

2. The *parellus*, or Craw-fish-eye Lichen: it grows on rocks, walls, stones, and on the trunks of trees; flowers from January to December.—This vegetable abounds on the rocks in the North of England, where it is collected, and sent to London in casks. It imparts a red colour, and is used in making the blue pigment, known under the name of *litmus*.

3. The *tartareus*, or Large Yellow-saucered Dyers' Liverwort, which abounds in the Highlands of Scotland, and in the county of Derby: it incrusts most of the stones at Urswick-Mere, and is in flower from January to December.—In Scotland, this species is gathered; cleaned; and, after being steeped in urine for the space of three months, it is formed into cakes; which, when dried, are pulverized, and employed for imparting to wool a fine scarlet colour, with the addition of alum. In England, it is collected and sold at the rate of one penny per pound, to dyers, for striking a purple dye.

4. The *omphalodes*, or Dark-coloured Dyers' Liverwort, Cork, Corker, or Arcell, which grows on rocks in several parts of Britain, and flowers the whole year. It is prepared in the same manner as the preceding species:—with the addition of lime, and a little salt, it imparts a reddish-brown to woollen cloth; which, if it be afterwards dipped in the blue vat, will acquire a beautiful purple tinge.—The dark-coloured liverwort is an useful *styptic*: it was formerly reputed in inflammatory fevers, cutaneous affections, and disorders of the liver; but is now justly exploded.

5. The *vulpinus*, or Gold-wiry Lichen, is found on the trunks of old trees, in various parts of Britain, and flowers during the whole year. It communicates a yellow colour to yarn; and, when mixed with pulverized glass, is strewed on carcasses in Norway, to destroy the wolves which infest that country.

6. The *prunastri*, or Common Ragged Hoary Liverwort, which grows on the trunks and branches of trees, and is in bloom from January to December. This species possesses the remarkable property of imbibing and retaining odours;

on which account its leaves, when pulverized, form the basis of several perfumed powders: they also communicate a red colour to yarn.

7. The *caperatus*, or Wrinkled Liverwort, which abounds on the surface of rocks, stones, trees, and pales; it also flowers throughout the year. In Ireland, and the northern parts of the Isle of Man, it is employed for dyeing wool of an orange colour. If serge be previously infused, and boiled in urine, or steeped in a solution of green vitriol, and then dyed with this plant, it will assume a fine russet-brown tinge; but, if it be simply immersed in a decoction of the wrinkled liverwort, the stuff will acquire a lemon shade.

8. The *pustulatus*, or Spotted Liverwort, which is found on rocks in Wales, and the northern parts of Britain; it flowers during the whole year. According to Linnæus, a beautiful red colour may be prepared from this species; and Dr. Withering states, that it may be converted into an excellent black pigment.

9. The *calicaris*, or Beaked Liverwort, grows sometimes upon trees, but more frequently on rocks, near the sea-coast. It is smooth, glossy, and whitish, producing flat or convex shields, very near the summits of the segments, which are acute and rigid; and, being often reflected by the growth of the shields, appear under their limbs like a curved beak.—This plant yields a fine red colour; and, in this respect, promises to become a substitute for the famous *Lichen Roccella* (see Orchal), which is imported from the Canary Islands, and sometimes sold at the price of 80l. per ton.—Both the present and the preceding species *(Lichen pustulatus)*, were formerly employed instead of starch, in the manufacture of hair-powder.

10. The *aphthosus*, or Green Ground-Liverwort; it grows on moist rocks, in shady, stony, and mossy places, and, like most of the preceding species, is in flower from January to December.—An infusion of this plant is made in milk, and given by the country people to children affected with the thrush.—A decoction of it, in large doses, operates powerfully both as a purgative and as an emetic; it is said to be a good vermifuge.

11. The *Islandicus*, or Esculent Iceland Liverwort, abounds not only in the Highlands and Lowlands of Scotland, but is also found in some of the more northern parts of England and Wales.—The inhabitants of Iceland boil this beneficial plant in several waters, then dry, and make it into bread. They likewise prepare from it a kind of gruel, which is mixed with milk; but the first decoction is never used; as it is strongly purgative. A jelly, or thick mucilage, made of the Iceland Liverwort, is recommended by Haller and Scopoli, as an excellent domestic remedy in consumptions.—In Germany, a very durable brown dye is obtained by first boiling linen yarn, for one hour, in a solution of alum and cream of tartar; then adding to this liquor the dried Iceland Liverwort, and suffering it to boil for half an hour at the least, when the yarn is again to be immersed for a quarter of an hour or longer, stirring it properly, and afterwards plunging it in a weak, cold solution of copperas or vitriol of iron.—But the Iceland Lichen also imparts a very excellent black to white woollen yarn, by previously boiling it for one hour in a liquor

a liquor made of the dried plant, and an equal quantity of copperas, in pure water; then removing it from this brown dye, and again boiling it for fifteen minutes in a strong decoction of log-wood: thus the wool assumes a deep black colour, which presents no other shade.

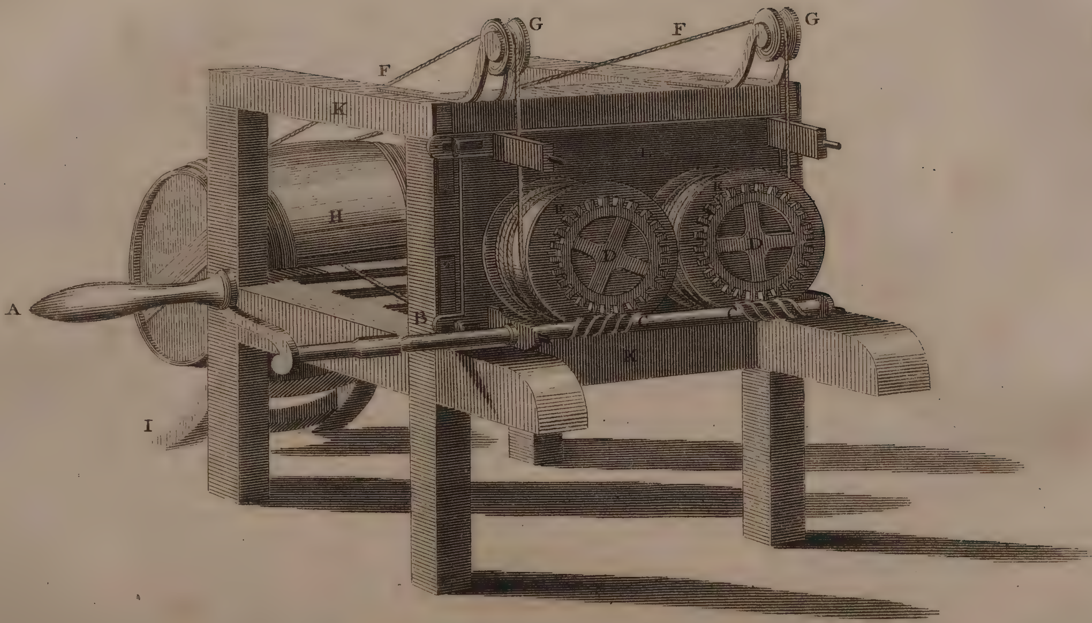
12. The *pulmonarius*, Lungwort-Liverwort, Hazel-Rag, or Hazel Crottles, which abounds on the trunks of old trees, especially those of oaks, and on heaps of stones, in moist shady situations.—It has an astringent, bitter taste; and is used in Siberia as a substitute for hops, though it renders the ale narcotic, and occasions the head-ach.—This plant was formerly much esteemed in consumptive cases.—According to Dr. Rutty, woollen cloth dyed with the lungwort, acquires a durable orange colour.

13. The *caninus*, or Ash-coloured Ground Liverwort, which grows upon the ground among moss, at the roots of trees in shady woods; and is frequently found on heaths, stony places, and in hedges: it is in flower throughout the year.—This species has acquired its celebrity by Dr. Mead's assertion, that it is an infallible preventive of the consequences arising from the bite of a mad-dog. He directed half an ounce of the dried and powdered leaves to be mixed with two drams of pulverized black pepper, and divided into four doses: one of these was to be taken by the person bitten, every morning fasting, in half a pint of warm cow's milk, for four successive days; after which he was to make use of the cold bath every morning, for a month.—It is, however, to be regretted, that the success of this, or of any other medicine recommended for the same purpose, has but seldom proved effectual.

14. The *cocciferus*, or Scarlet-bearing Liverwort, which is common on heaths, and flowers from October to April. This species assumes various appearances, according to its age, situation, and other circumstances affecting its growth. It may, however, be easily distinguished by the fungous tubercles, which are of a beautiful scarlet tinge, and grow on the top of its stalk. These excrescences, when steeped in a solution of pot-ash, are said to impart a fine and durable purple.

15. The *plicatus*, Officinal Stringy Liverwort, or Tree-moss, which grows on the branches of trees in thick woods, and is in flower from January to December.—It was formerly used as an astringent to prevent hœmorrhages, and to cure ruptures.—Linnæus observes, that the Laplanders successfully apply the tree-moss to their feet, with a view to relieve the excoriations occasioned by too great exercise. Professor Kalms remarks, that if this vegetable be collected from fir or birch-trees, it communicates a green colour to wool, previously boiled in alum-water.

16. The *barbatus*, v. *articulatus*, or Bearded Liverwort, thrives in woods, and on the branches of trees; flowering throughout the year. It grows from half a foot to two feet in length, is of a whitish-green cast, and possesses considerable astringency.—When steeped for some time in water, the whole plant acquires a red-orange colour; which is employed by the inhabitants of Pennsylvania to impart that tinge to various stuffs.



Portable Machine for Loading & Unloading Goods.

17. The *Roccella.* See ORCHAL.

It is remarkable, that the *lichens,* or mushrooms, cannot be propagated by seed; and that, with these fungous productions, there appears to commence a new and intermediate kingdom, partaking both of vegetable and animal nature: so that the generation of fungi seems to be involved in a process of fermentation, which suddenly assumes a vegetable form.

LIXIVE. See POT-ASH.

LIXIVIUM, or LEY, signifies a solution of salts or ashes in water, for the different purposes of bleaching, washing, dyeing, &c.—Having, in the progress of this work, frequently employed the term *lixivium,* we shall in this place only observe, that a ley may be made either of the vegetable or mineral alkali; that the latter is often found native in some parts of the earth, as well as universally combined with the waters of the ocean; but that the former is uniformly obtained from the ashes of burnt vegetables. Hence a lixivium may be prepared even from straw reduced to ashes, if more substantial plants cannot be procured on the spur of the occasion.

LIZARD, or *Lacerta,* a genus of amphibious animals, consisting of several species; the most remarkable of which is the *Agilis,* or Common Green Lizard, a native of Britain. It is extremely nimble; of a green colour; and, though perfectly harmless, its form inspires general disgust.—During the heat of summer, this animal delights to bask on the sides of dry banks, or beneath aged trees; but, as soon as it is noticed, it immediately retreats to its hole.—The food of lizards consists of insects, and they are themselves devoured by birds of prey. But, notwithstanding their terrific appearance, these animals are of real service, especially in gardens; and ought by no means to be destroyed, merely to gratify an unnatural and cruel aversion.

LIZARD-FLOWER. See SATYRION.

LOADING OF GOODS, the act of removing ponderous substances, such as timber, corn, or other merchandize, to a cart or waggon.

As various accidents happen by the removal of heavy goods, especially on wharfs, and other crowded places, we shall communicate a contrivance which is eminently calculated both to facilitate labour, and to prevent misfortunes. In this respect, we are indebted to Mr. GEO. DAVIS, of Windsor, Berks, on whom the "Society for the Encouragement of Arts," &c. in 1797, conferred a premium of forty guineas, for his useful invention.

Description of the Plate representing Mr. DAVIS'*s "Portable Machine for loading and unloading goods."*

A, the winch turning the bar B, on which are two endless screws, or worms, C C, that work in the toothed wheels DD. These wheels are fixed to the barrels EE, round which the ropes FF coil, wind up, or let out the same occasionally: the ropes pass over the pullies GG; are brought round; and their ends, being furnished with hooks for that purpose, are hitched into staples fixed to the front of the cart, or other carriage. Within these ropes, the load H is placed on a common pulley I, that forms an inclined plane, up which, by turning the winch, the ropes are wound upon the barrels; and thus the load is raised into the carriage.

KK, the frame, intended to shew

the part of the cart, or other carriage, on which the machine is to be occasionally placed.

The whole of the barrels and cogged wheels are contained in an iron box L; the sides of which are represented in the plate, as taken off, in order that the arrangement of the different parts may be better conceived.

The pullies on the stage (G G) may, in most cases, be affixed to the machine itself, which is adapted to every direction, and will suit carriages of every construction.

The model corresponding to the present engraving, is made on the scale of about four inches to a foot; and the inventor states, that it will raise upwards of five cwt.—he is therefore confident, that his machine, when constructed of its intended size, will be capable of loading a ton weight by *one man only*; and that, even upon this enlarged plan, it does not exceed 112lb. in weight.

Loadstone. See Magnet.

LOAM, in agriculture, a species of earth, less cohesive than clay, but more compact than chalk.

There are several varieties of *loam*; the most common of which we shall enumerate.

1. The *clayey*, that is likewise called *string*, *stiff*, *cold*, and *heavy* loam: it consists of a mixture of clay and coarse sand; is distinguished by the name of *Windsor loam*, and is much used for making bricks, building furnaces, &c.

2. The *chalky* loam; the constituent parts of which are chalk, clay, and coarse sand.

3. The *sandy* loam, consisting of the same ingredients as the preceding kind, though the sand prevails in a larger proportion. The two latter varieties are frequently blended, and compose what is called a *deep crumbly* loam. This was formerly supposed to be unfit for vegetation, till it had been exposed for several years to the influence of the sun, air, frost, &c. Experience, however, has evinced the contrary; and it is certain, that though the vegetative powers of this *barren earth* (as some have disdainfully called it) remain latent for a longer time than in soils which have undergone a proper degree of fermentation; yet, after its surface is broken up and properly stirred, it will, at the expiration of *one* year, be well adapted to the production of crops.

A deep crumbly loam is particularly calculated for the growth of fruit-trees; and, if it be laid in ridges during one winter, and the succeeding summer, it will afford ample nourishment to such trees; even though it should have been turned up from the depth of 6 feet in the ground.

Lob-grass. See Brome-grass, the Soft.

LOBSTER, or *Cancer*, L. a genus of insects comprising 20 species; the principal of which is the *grammarus*, or Common Lobster: it has a smooth breast, four pair of legs, six joints in the tail, and rounded train-fins.

These creatures inhabit the clearest water, at the foot of rocks that impend over the sea. They are brought in vast quantities from the Orkney isles, and several parts of the eastern coast of Scotland, to the London markets. Being extremely prolific, they begin to breed in the spring, and continue to spawn during the greater part of the summer. Dr. Baster counted 12,444 eggs under the tail of one lobster, beside those which remained ed in the body unprotruded: after being deposited in the sand, these embryons are soon hatched.

Lobsters change their shell annually, and acquire a new one in a few days: like crabs, they will renew their claws, if deprived of them by accident. These shell-fish are remarkably voracious, feeding on sea-weeds, garbage, and all sorts of carcass.

Few lobsters are taken by the hand; as the greater number are caught in *pots*, or a kind of trap constructed of twigs, baited with garbage, and formed similar to a wire mouse-trap, so that the insect, after entering it, cannot escape. Such machines are fastened to a cord sunk in the sea, and the place is marked by a buoy. In summer, they are found near the shore, and thence to about six fathoms deep; but, in winter, they are seldom taken in less than 12 or 15 fathoms of water.

Lobsters continue to grow in size only while their shells are soft. Those selected for the table, ought to be heavy in proportion to their size, and be furnished with a hard crust on their sides, which, when in perfection, will not yield to moderate pressure. Barnacles, and other small fish, adhering to them, are considered as certain signs of superior quality. The male lobsters are, in general, preferable in the winter, and may be distinguished from the female, by their narrow trains, and a strong spine upon the centre of each transverse prominence beneath the tail.

The meat of a lobster's claw is more delicate and easy of digestion than that from any other part; yet there have been instances where the eating of this shell-fish has been productive of disagreeable effects, especially when it is consumed in a state approaching to putridity. Thus, the greater number of lobsters sold in London are boiled and re-boiled every day, for a week, or longer, to sweeten them *externally*, though the inner part is generally corrupted. Such a dish cannot fail to be extremely unwholesome; and we advise those who have inadvertently partaken of it, and are in consequence affected with putrid eructations, to drink large portions of strong lemonade, or a mixture of vinegar and water; because vegetable *acids* are in this case the most efficacious *antidotes*. Sometimes, the immoderate use of lobsters is attended with eruptions of the erysipelatous kind in the face, or a species of nettle-rash over the whole body; either of which, being salutary efforts of Nature to expel noxious matter, are more troublesome than dangerous.

LOCK, a well-known contrivance for fastening doors, chests, or the like; and which is generally opened with a key.

From the different structure of locks, adapted to various purposes, they acquire different names.—Those fixed on outer doors, are called *stop-locks*; those on chamber-doors, *spring-locks*; and such as are affixed to trunks, are known by the name of *padlocks*, *trunk-locks*, &c.—Of these, the spring-lock is the principal, both on account of its more general utility, and for the curious intricacy of its structure. Its chief constituent parts are, the main-plate; cover-plate; and pin-hole: to the first belong the key-hole, top-hook, cross-wards, bolt-toe, or bolt-knab, draw-back spring-tumbler, pin of the tumbler, and staples.—With the cover-plate are connected ed a pin, main-ward, cross-ward, and step-ward or dap-ward: lastly, the pin-hole corresponds with the hook-ward, main-cross-ward, shank, pot or beard, bow-ward and bit.

The excellence of locks consists in the security they afford; and as numberless schemes are continually brought forward by designing men, to elude every contrivance of the most ingenious mechanics, the invention of a durable lock, so constructed as to render it impossible for any person to open its without proper key, has ever been an object of considerable importance.

In the year 1784, the *Society for the Encouragement of Arts*, &c. conferred their silver medal on Mr. TAYLOR, of Petworth, for his improvement on the latch or spring-bolts of common locks. This is effected by simply reversing the tumbler, so that its curved side acts against two stubs fixed on the tail of the latch, and thrusts back the latter with ease; whether the knob be turned to the right or to the left, when the lock is opened. Mr. TAYLOR has also, behind the tail of the latch, fixed a guide containing a groove, in which runs a small *friction-wheel*, that serves to keep the latch in its direct situation, and at the same time to diminish its friction: the arms of his tumbler are somewhat contracted, in order that the latch or spring-bolt may move with greater facility. By this construction, the parts of the tumbler and latch, which are in contact, move in a line, so that they pass over the greatest space, under the smallest angle; and the lock itself may be constantly used for several years, without requiring the application of oil.

The same Society also granted, in the same year, the sum of ten guineas to Mr. MARSHAL, for a *secret escutcheon*, which, when fixed to a lock, may be so repeatedly varied, that even the artist who made it, is unable to open the lock: as, however, a satisfactory description of its mechanism cannot be given, without the aid of engravings, we refer the reader to the 3d vol. of the Society's *Transactions*.

Various patents have been obtained for the construction of locks, so as to prevent the possibility of picking them: the principal of these is Mr. BRAMAH's, registered in 1784; and Mr. SPEARS's, in 1795; but, as the account of those inventions would be unintelligible without the aid of several engravings, the curious reader will consult the 5th and 8th vols. of the *Repertory of Arts and Manufactures*, where they are minutely specified.

LOCK, in *inland navigation*, denotes all such works (whether of wood or stone) which are intended to raise the water of a river; but it is more particularly applied to a kind of canal inclosed between two gates, the upper of which is called a *sluice-gate*, and the lower a *flood-gate*. These serve to confine the water, and thus to facilitate the passage of boats, both in ascending and descending the canal.

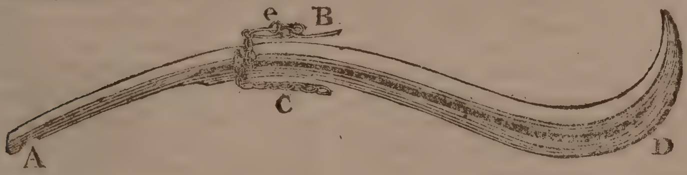
In the year 1791, a patent was granted to Mr. JAMES PLAYFAIR, architect, for his method of constructing the locks of navigable canals on a new principle, and also for improving such as are already erected. With this design, a certain portion of water, in the ascent and descent of vessels, is conducted into reservoirs or cisterns communicating with the lock upon different levels, and thus eventually saved; because their apertures may be opened and closed at pleasure, so that only the sixth part is required for the passage of boats. The particulars of this ingenious contrivance are inserted, and illustrated with engravings, in the 3d vol. of the *Repertory of Arts*, &c.

Another patent was granted, in 1798, to Mr. James Fussell, for his invention of a machine or balance-lock, serving to raise or lower boats on canals; an account of which appeared in the 11th vol. of the work before quoted.

Locked Jaw. See Jaw.

LOCKING-POLE, an ingenious piece of mechanism, to be affixed to the wheels of waggons or other carriages, when descending steep hills.

As many distressing accidents happen from carts over-powering the shaft-horse, when proceeding down declivities, Mr. Thomas Colley laid before the Society for the Encouragement of Arts, &c. a contrivance for preventing such casualties; in consequence of which, he was rewarded with their silver medal. The following cut represents this useful invention:



A, The hollow, which lies on the nave of the wheel.

B C, The chains, that clip the felly of the wheel.

D, The front part of the pole, shod with iron; and which is farther strengthened by a rib of iron, that is rivetted along its side, as is indicated by the black line, in the cut.

In order to apply this locking-pole, the chain C is put round the felly of the wheel: the pin B is passed through the last link of C, and turned back through the movable ring *e*: thus the wheel is secured, and any waggon, however laden, may descend the steepest hill with safety.

To prevent the locking-pole from breaking, Mr. Colley directs it to be made of the stem of an ash-tree, the *spurns*, that is, the beginning of the roots of which, have not been cut off in felling. He farther remarks, that if a horse, which has been accustomed to such situation and to descents, be put in the shafts, the animal will be so much inclined to hold back, that it will be extremely difficult to make him draw. This exertion, however, is absolutely necessary; as otherwise the chain-horse, which should always be linked to the locked side, will be obliged to pull an unnecessary weight, occasioned by his being considerably lower than the points of the shafts.

Lastly, in conveying the locking-pole from one declivity to another, it is to be placed between the lower part of the cart and the axle-tree, while the smaller end is to be buckled with a strap fixed under the body of the cart, on the driving side.

LOCUST, or *Gryllus Locusta*, L. a family of insects, natives of Asia and Africa, where chiefly two species are remarkable, namely:

1. The *Shielded Locust*, so called from the pectinal shield covering its breast. It is marked with a greenish hue, but a deeper yellow beneath its body, and the inside of the hind legs is red: it attains the size of a robust man's finger, and is eaten in the East; an instance of which occurs in Scripture, where it is recorded that St. JOHN used this insect as his food.

2. The *Migrating Locust*, which is of a smaller size, has a greyish-blue head, yellowish and brown spotted wings above, green ones below, and a reddish belly behind. Its peculiar native soil is Great Tartary, whence these insects have sometimes migrated into Europe, (flying at the rate of twenty-five English miles in a day), and committed extensive devastations in corn-fields. They multiply more speedily than any animal in the creation, but are formidable only in the countries where they breed; being unable to live in cold climates.—In the year 1748, a flight of these depredators was seen in Britain, but they fortunately occasioned no damage. If, however, at any future period, they should again invade this island, it will be advisable to burn, previously to their approach, such combustibles as emit a thick and offensive smoke; for instance, turf, wet straw, &c. sprinkled with sulphur.—An instance occurred many years since, in Germany, where a swarm of locusts was driven from one district to another, by the noise of bells, spades, hammers, and other metallic instruments.

LOG-WOOD, *Hæmatoxylum Campechianum*, L. an exotic plant, which grows wild in the bay of Campeachy, Honduras, and other parts of the Spanish West Indies, where it rises from 16 to 24 feet in height.—In the beginning of the 18th century, it was introduced into Jamaica, where it is employed as a fence against cattle.—If the lower branches be pruned away, while the tree is young, it will grow to a considerable size; and, when old, its wood will be of equal value to that imported from Honduras.—The trees are cut into billets, the bark and white sap of which are chipped off, while the red part, or *heart* only, is selected for sale.

Logwood is used in great quantities for dyeing purple, green, blue, and especially for *black* colours; according to the different ingredients employed. The last mentioned dyes, however, are not *durable*, unless previously tinged *brown*, in a decoction of the dried Iceland Liverwort (see p. 117); which serves as the basis of fixing the colouring matter. Indeed, there are many indigenous plants that may be advantageously substituted for logwood, and other dyeing drugs; a general survey of which, the reader will find in our *General Index of Reference*, to be given at the conclusion of the present work.—Hence we shall only add, on the authority of PÖRNER, that in all the experiments made with logwood, he found alum, without adding any cream of tartar, to produce a better effect than in a state of combination with this acid; and, for fixing or rendering the different colours more durable, blue vitriol was uniformly the most successful ingredient.

Independently of its utility as a dyeing drug, logwood has lately been found to possess considerable astringency as a medicine: hence a decoction, as well as an extract from it, has been given with advantage, in cases of diarrhœa.

LONGEVITY has ever been a desirable object among the rational part of mankind; though the licentious epicure appears to measure the duration of his life by the *good things* he has enjoyed, rather than by the number of years he has lived.

Longevity depends on a variety of circumstances, which, since the introduction of manifold luxuries, rarely unite in the same person: the principal of these is an *hereditary disposition*, which might be more regularly transmitted to children, if the frequent abuse of solid and liquid aliment, especially the custom of giving them fermented and spirituous liquors, together with the indulgence in the fashionable enervating passions, were not alike conspicuous in the present state of society, among youth and adults.

Other requisites to longevity are, a perfect birth or formation of the infant, supported by proper and rational treatment; a gradual cultivation of the mind; a constitution uncontaminated by hereditary disease; and a tranquillity that is not easily disturbed by external objects. Where these conditions prevail, and strict temperance is observed, there is a prospect of attaining to a mature old age:—from the contrary causes, or conduct of individuals, the alarming increase of deaths in large towns, may be easily explained; and especially if it be contrasted with the more simple, though gross, habits of a country-life.—See LIFE and DEATH.

LOOKING-GLASS, a plain glass mirror; which, being rendered impervious to light, exhibits the images of such objects as are placed before it, apparently at the same distance behind.

Looking-glasses are made of plate-glass, which is cast and ground in the manner described under the article GLASS. When the plates are polished, a fine blotting paper is spread on the table, and strewed over with levigated chalk, which is covered with a thin leaf of tin-foil. Upon the latter is poured the purest quicksilver, that ought to be distributed uniformly over the leaf, with cotton or other soft substance: over the mercury, clean paper must be placed; and upon this, at length, the glass-plate is pressed down by the right hand, while the paper is gently removed with the left. The plate is now covered with a thicker paper, or cloth, and a heavy weight laid on it, so that the superfluous quicksilver may be expressed, and the tin adhere closely to the glass: when it is sufficiently dry, the weights are taken off, and the work is complete.

Looking-glasses are equally ornamental and useful in domestic life: hence they should not be exposed to accidents, or placed against damp walls, or in other moist situations, where the quicksilver loses its tenacity, and the beauty of the glass will, in a short time, be impaired.—Those idle or conceited persons, who waste every day a *certain* portion of time, by examining their dress and countenance before a looking-glass, ought to bestow an equal share of attention on their moral scrutiny: thus, we trust, they will easily discover how to make a more proper and *economical* use of their leisure hours, which are literally *killed* before a mirror, that exhibits only the *surface* of things.

LOOM, a machine, by means of which several distinct threads are combined into one piece, or contexture.

Looms are of various forms, according to the different materials to be woven; and the various methods of weaving.—As our limits do not permit us to detail them, and as they would be unintelligible, without the aid of engravings, we shall briefly mention Mr. SAMUEL SHOLL's improved *Silk Loom*, for which the Society for the Encouragement of Arts, &c. in 1790, conferred on him a silver medal. His ingenious contrivance is peculiarly calculated for the lighter branches of silk-weaving: by its construction, it admits more light to the workmen, and may be placed in almost any low garret, without breaking the walls;—the *porry* may be made of any length, by only screwing the cane-roll posts nearer or farther from the breast-roll; and it is, on the whole, more portable, and fixed with less trouble, than any loom hitherto invented. Another advantage is its cheapness; the price being one-third less than that of the common looms; beside which, the most valuable parts of the old materials may be still preserved, and adapted to the new machinery.—For a more minute account of Mr. S.'s contrivance, the reader will consult the 8th volume of the *Transactions* of the patriotic Society above-mentioned.

LOOSE-STRIFE, the CREEPING, or *Lysimachia nummularia*, L. an indigenous, perennial plant, growing in moist, shady meadows; and flowering in the months of June and July.—This vegetable affords a wholesome food for cattle, and especially for sheep. On account of its sub-acid and mildly astringent properties, it is considered as one of the most efficacious vulnerary herbs.—BECHSTEIN asserts, that the leaves and flowers of this plant, steeped in oil, furnish an excellent remedy for destroying the worms and insects infesting the floors of granaries.

LOOSE-STRIFE, the HYSSOP-LEAVED, or *Lythrum hyssopifolium*, L. an indigenous annual plant, which grows in stagnant waters, and marshy grounds: in the month of August, it produces bright purple flowers, from which a very beautiful pigment may be extracted, in the manner pointed out vol. ii. p. 38, under the head of COLOURING-MATTER.

LOOSE-STRIFE, the PURPLE, or PURPLE-SPIKED WILLOW-HERB, GRASS-POLY, *Lythrum Salicaria*, L. an indigenous perennial plant, growing in marshes, and on the banks of rivers; flowering in the months of June and July.—This neglected vegetable is remarkable, as every part of it acquires a red colour, when it begins to decay. MORAND observes, in the *Memoirs of the French Academy*, for 1769, that he found roots and branches of the purple loose-strife buried under ground, between the rind of which were deposited several particles of a beautiful blue colour; and that, by chemical analysis, they proved to be a true *native Prussian blue*.—SUCKOW obtained from the flowering stalks, on the addition of green vitriol, a deep black dye; and DAMBOURNEY, on preparing the cloth in a diluted solution of bismuth, a very fine chesnut tinge.—In tanning, likewise, the whole plant, while in blossom, has been employed with advantage; so that, according to GLEDITSCH, excellent

lent sheep-skins were fully dressed, in the course of twelve days.

Lopping. See Pruning.

Lords-and-Ladies. See Wake-robin.

Lotion. See Washing; and Cosmetics.

LOTTERY, a kind of public game at hazard, which, in this country, is managed by commissioners appointed by parliament. It consists of a certain number of tickets, that are drawn out of two different wheels, one of which contains a limited proportion of blanks and prizes; and the other, the corresponding tickets.

Lotteries were originally instituted with a view to raise money for the service of the State; but this method appears to have been contrived by persons, who possessed no practical knowledge of mankind; as it encourages a spirit of gambling, that cannot be too severely censured. One of the most cogent arguments to discourage this practice, appears to be the disproportion between the *distant* gain, and the *probable* loss of the numerous adventurers: nay, it is an indisputable fact, that if a *club* of infatuated persons (indeed, there are too many of this description) were to purchase the tickets of the whole lottery, they would necessarily lose about *fifty per cent.* of their money; and in a similar situation is the single share-holder, who, besides, incurs the risk of losing the whole.

It is to be regretted, that the consequences of this evil are not confined to the more opulent class of society; but extend even to those industrious members, whose utmost exertions are frequently inadequate to furnish their families with *bread.* Yet such is their infatuation, that nearly the whole of their weekly earnings is squandered on *insurances:* and it is a melancholy proof of the folly of mankind, that of the bread usually consumed, *one-third* only is eaten during the eventful period of drawing the lottery. Hence we think it our duty to state abuses of such magnitude; as they prey on the vitals of the community: and we trust that the wisdom of the legislature will shortly be induced to reform, or, if possible, to abolish the whole department of the lottery, and to adopt a less hazardous, and more dignified plan of finance.

LOVAGE, or *Ligusticum*, L. a genus of plants, consisting of thirteen species, two of which are natives of Britain. The principal of these, is the *Scoticum*, Scottish Lovage, or Sea-parsley, growing on rocks and cliffs near the sea-coast in Scotland, and the Western Islands; flowering in the month of July. It is relished by horses, sheep, and goats, but refused by cows. This species is greatly valued in the Isle of Sky, where it is eaten either as salad, or boiled as greens: its roots are reputed to be excellent carminatives, and an infusion of the leaves affords a good physic for calves.

LOVE, generally speaking, denotes all those pleasing sensations which are excited by certain objects, or incidents. It, however, more frequently expresses that affection which consists of personal desire, esteem, and benevolence; which forms a bond of attachment, and cements the union of individuals of different sexes; so that each feels, in the society of the other, a kind of happiness which no other object can impart.

The effects of this passion, on the efforts and disposition of man, are often surprizing: it operates in a manner equally beneficial on the body, and has sometimes remedied the most inveterate complaints, which had defeated the skill of physicians, and resisted the powers of medicine.

Though the most impetuous of all the passions, its progress is generally slow; and, if due precautions were taken, it would seldom be attended with unfavourable consequences.—Reason, however, often fails to subdue the first attacks of love, so that it ceases to excite pleasure, and not unfrequently reduces its victim to the lowest state of despondency. Hence it is advisable to remove every object, that tends to kindle the passion; and to introduce the patient into cheerful society. With the same intention, the strictest temperance should be observed; the mind and body alternately employed, by study or exercise; while the diet ought to be low, and less nourishing than usual. But the most efficacious remedy, in the plurality of instances, would be the union of the two parties; and, if parents were more solicitous to consult the *real* inclination and interest of their children, we are persuaded, that not only the number of wretched couples might be considerably diminished, but the public streets of populous cities would not be infested with those hapless females, who are at present doomed to perdition:—they afford, indeed, too many incontestible proofs of the imperfect state of society.

LOVE-APPLE, or *Solanum Lycopersicum*, L. a native of the East and West Indies, whence it has been introduced into our gardens. It is propagated from seeds, which are sown in the month of March, in a hot-bed of a moderate temperature. When the plants have attained the height of about two inches, they are transplanted into another bed of a similar warmth, where they are set four inches asunder. In this state, they require constant moisture till the month of May, at which time they are finally removed into pots; frequently watered, and shaded till August, when their red fruit becomes perfectly ripe.—The love-apple is greatly esteemed at the table of the epicure: it is either used in soups or broths, to which it imparts an agreeable acid taste; or it is boiled and served up as a *garnish* to dishes of animal food.

LOUSE, in zoology, a genus of insects too well known to require any description.

Lice are not peculiar to mankind, but infest quadrupeds, birds, fishes, and vegetables. Each class of animals is troubled with a particular species of these vermin; and birds are remarkably obnoxious to their attacks. There are forty different species of lice that prey on the fluids of living animal bodies, and which are distinguished by their colour, shape, and size; nay, even insects, such as snails, spiders, and bees, are not exempt from them.

The human race is liable to be exclusively invaded by three different species of lice; namely, 1. The Crab, or Body-louse, which never appears in clothes, or on the head, but harbours only in some parts of the bodies of uncleanly, or such persons as are disordered by dissipation: it is easily exterminated, by applying a strong decoction of tobacco, or mercurial ointment,

ment. 2. The Clothes-louse is larger than the next species, and has a thicker head; it visits the skin only for imbibing the necessary portion of its nourishment, when it retreats to the folds and seams of clothes: these vermin may be speedily destroyed by fumigating the articles of dress with sulphureous vapours. 3. The Head-louse frequents only that part of the body, and is so prolific, that each female, in the course of twelve days, deposits several hundred eggs, or *nits*, which are closely cemented to the hair, and hatched in six or seven days, by warmth and perspiration: after three weeks, the young brood is fit for propagating their species; and as there are, perhaps, a hundred females to one male insect, their rapid increase may be easily conceived.—Want of cleanliness; immoderate warmth; violent perspiration; and a corrupted state of the human fluids, remarkably promote their generation.—Among the most simple and harmless remedies for extirpating these vermin, is the seed of parsley reduced to a fine powder.—But, if the humours of the whole animal body are in so vitiated a state, that the blood is contaminated by sensual excess of every kind, there arises the *morbus pedicularis*, or the most dreadful of all diseases, in which those disgusting insects are bred in ulcers, and cover the whole frame, so that the ill-fated victim cannot be relieved.

Some constitutions, however, are more exposed to these odious vermin than others; and it is remarkable, that sea-faring men, performing voyages to the East Indies, though infested with them on leaving Europe, lose them in a certain degree of latitude during their voyage; but, on their return, are again liable to their incursions.

Beside the remedies already suggested, we shall only observe, that in cases where danger is apprehended from lice, it will be useful to take nourishing, succulent food, and to use wholesome drink.—As a cure for the pedicular disease, MERCURIALIS advises frequent purgatives; at the same time, to anoint the parts affected with garlic and mustard; to make use of salted and acid food; to bathe, and to foment the body with a decoction of gall-nuts;—but the most effectual remedies are, sulphur and tobacco, mercurial ointment, black pepper and vinegar.

LOUSE-BERRY. See SPINDLE-TREE.

LOUSE-WORT, or *Pedicularis*, L. a genus of native perennial plants, comprising two species, viz.

1. The *palustris*, or MARSH LOUSE-WORT, which grows in marshes, ditches, on moist meadows, and in pastures; where it flowers in the months of June and July.—This vegetable is eaten by goats, though not relished by hogs; and refused by horses, sheep, and cows; in the latter of which, if accidentally swallowed among other grasses, it occasions bloody urine. Hence this dangerous and troublesome weed ought to be diligently eradicated.

2. The *sylvatica*, COMMON or PASTURE LOUSE-WORT, thrives on wet pastures, and heaths; it flowers in June and July.—This plant is refused both by cows and swine: it is particularly noxious to sheep; which, if fed with it, will, in a short time, be covered with scabs and scurf; their wool will become loose, and be over-run with vermin:—the expressed juice, or a

decoction, of this herb has been advantageously applied, by way of an injection, to sinuous ulcers.

LOZENGE, a form of various medicines moulded into small, flat cakes, to be held or chewed in the mouth, till they are dissolved.

As lozenges are of considerable utility for various purposes, we shall give a few instructions for preparing them, together with some simple recipes.—First, particular care ought to be taken that no decayed or impure matter be admitted into the powder; the dry aromatics should be moistened with a little water during the pulverization; and those which possess a greater degree of humidity, ought to be gradually dried in a gentle heat, before they are committed to the mortar. If the mass prove so viscid as to adhere to the fingers in mixing the ingredients, the hands may be rubbed with any sweet oil; or some pulverized liquorice, starch, or flour, may be sprinkled over them during the process. As soon as the lozenges are formed, they must be placed on an inverted sieve, in a shady but airy situation, where they should be frequently turned, in order that they may be perfectly dried; and, when all moisture is exhaled, they should be preserved in glass, or in well-glazed earthen vessels, secure from the influence of damp air.

Liquorice Lozenges :—Let four ounces of the extract of liquorice (Spanish juice); a similar quantity of gum-arabic, and eight ounces of double-refined sugar, be dissolved in warm water, and strained; after which the ingredients are to be evaporated to a proper consistence.—This preparation is an agreeable pectoral, and may be used at pleasure: it is well calculated to allay that tickling sensation in the throat, which excites coughing.

White Pectoral Lozenges, consist of one pound of double-refined sugar; four ounces of gum-arabic, and one ounce of starch: these ingredients should be finely pulverized, and formed into a mass of a due consistence for lozenges, which in their effects are similar to those of the preceding composition.

Liquorice Lozenges with Opium :—Take two drams of pure opium, and half an ounce of tincture of Tolu: let the opium be ground with the tincture till it be perfectly dissolved, when eight ounces of common syrup, and five ounces of extract of liquorice previously softened in warm water, are to be gradually added. While these ingredients are triturating, five ounces of pulverized gum-arabic are, by degrees, to be sprinkled in the mixture; and, as soon as the whole is incorporated, it may be formed into lozenges, each of which should weigh ten grains.—These are very serviceable for troublesome coughs that depend on an irritation of the fauces, which they remarkably tend to relieve; but should not be used too freely, as the large proportion of opium they contain, cannot fail to render the body costive.

Lozenges of Magnesia.—Let four ounces of magnesia, two ounces of double-refined sugar, and one scruple of pulverized ginger, be incorporated with the mucilage of gum-arabic, and worked into a proper form. This preparation is eminently useful to those who are troubled with the heart-burn; especially if that complaint depend on acidity generated in the stomach.

LUCERN, or *Medicago sativa*, L. a valuable exotic plant, which sometimes grows naturally in meadows, pastures, and on ditch-banks; flowers in the months of June and July.—It was introduced from France into Britain, about the middle of the 17th century.

Lucern thrives best in deep, rich, friable loams, whether they abound in sand or gravel; as well as in all good dry soils, and in the coldest climate. As the luxuriance of its crops depends entirely on keeping the soil clear from weeds, this circumstance ought to be particularly attended to, while the plant is young. The land ought, therefore, to be previously cleaned; for which purpose Mr. YOUNG recommends two successive crops of turnips or of carrots, as the most successful mode of preparing it; but, if a fallow be found more convenient, a man should follow the ploughs or harrows while working; collect all roots, weeds, &c.; and clear away such as have taken too deep root, to be eradicated by those implements. The soil must be ploughed and harrowed three times in the second spring, previously to the sowing, in order that it may be perfectly pulverized.—There is no absolute necessity for manure; though, when laid on, it should be spread with the first crop of carrots or turnips.

The land being thus prepared, lucern may be propagated either by sowing it broad-cast; by drilling; or by transplanting it; all of which methods have been attended with such success, as to render it difficult to decide which is the most advantageous. The proper season for sowing, is towards the end of March, or in the month of April: if broad-cast, 20lbs. of seed will be required for one acre; if drilled, 6lbs. will suffice, provided the seed be set in equi-distant rows of two feet; and, if the lucern be sown with corn, the value of the crop will be considerably increased.—The best grain for this purpose, in Mr. YOUNG's opinion, is *oats*; 6 pecks of which should be sown on an acre of very rich land; but, if the soil be indifferent, two bushels are requisite; and, if it be *poor*, three bushels are to be allowed to each acre.—As soon as the oats are sown and harrowed, the lucern should be deposited in the ground, and a light harrow passed over; a similar method ought to be adopted if the seed be drilled; but, if sown in a nursery, with a view to transplantation, it should not be mixed with any corn, but committed to the ground early in the spring; after which the young plants ought to be carefully *hand-hoed*, to facilitate their growth till the month of August, when they will have attained sufficient size to be removed to the field. This operation is performed by taking up the plants with a sharp spade, during moist weather; then cutting off the tap-roots, eight, nine, or ten inches beneath the crown of the plant; though the lateral fibres must be somewhat shortened, and the stalks clipped off about five inches above the crown. After these operations by the knife, the plants are to be thrown into a vessel of water, and placed in the shade, that they may retain their freshness. Holes are next to be made with a dibble, and filled with water, in which the roots are set at the distance of forty inches from each other, the stalks being earthed up to the height of two inches. Should a dry season succeed, it will be requisite to water the plants liberally; as they will thus not only be invigorated, but the soil will be settled around their roots. — The intermediate spaces ought to be carefully cleared from weeds after every cutting; and when the plant arrives at perfection, it will admit of being mowed five and even six times in one season.

Lucern is of great value, and fully merits the commendations bestowed upon its culture. On rich and well-tilled soils, its growth is so rapid, that it rises to the height of *eighteen* inches within *thirty* or *forty* days; and its produce on poor land is fully adequate to maintain three horses per acre; though, if the ground be well managed, it will readily support from three to six horses. The expence of raising this plant is very considerable: Mr. HARTE, in his *Essays on Husbandry* (8vo. 5s. 6d. 2d edit.) estimates it, when transplanted, at 6l. 12s. per acre for the first year; and the cost of the second, as well as each subsequent year, during the continuance of the plant (which may be fixed upon an average at ten years), will amount to about 2l. per acre. If lucern be drilled, Mr. YOUNG computed, in 1796, the expence of the first year to be as follows:

	£.	s.	d.
Two spring-ploughings, extra	0	18	0
Harrowing	0	2	6
Eight pounds of seed	0	8	0
Drilling	0	2	6
Horse-hoeing in autumn	0	2	6
Hand-hoeing in ditto	0	5	0
First year	£. 1	18	6
Annual:			
Rent, tythe, and rates	1	10	0
Four horse-hoeings	0	10	2
Three hand-hoeings	0	12	0
Five mowings	0	12	6
Raking together	0	5	0
Loading and carting home	0	7	6
Manuring, to the annual amount of	0	12	0
	£. 4	9	2

Mr. YOUNG observes, that it is difficult to calculate the expence of mowing, raking, and carting, unless the plantation be sufficiently large to furnish employment for a man, boy, and horse. He is aware of having computed it rather high, though he has not perhaps exaggerated the cost, if the loss of time necessarily attendant on short employ be properly considered. He is therefore inclined to raise the total annual expence to 5l.: because he believes that an acre of land cannot be cultivated for a smaller sum, even by very excellent management.

Notwithstanding such heavy expences, the crops of lucern have, in every case, been found adequate to them, so as to answer exceedingly well; and Mr. YOUNG is of opinion, that if the value of the food be estimated by the maintenance of cattle per week, it will pay nearly *cent. per cent.*

The first use of this beneficial plant is that of *soiling* horses in the stable: for this purpose it is peculiarly advantageous; few other articles of food agreeing so well with those animals. It is likewise eminently adapted to the soiling of working oxen, cows, young cattle, and even hogs, in a farm-yard. In short, Mr. YOUNG conceives lucern to be well calculated for fattening oxen, though it has never been tried with such design. Farther, as hogs do not bite so closely as sheep, he supposes that the former might eat it with safety, and that a small field, planted with it, near the farm-yard, "would be of admirable use and profit."

Beside these various purposes to which lucern is subservient, it ameliorates the soil, so that considerable crops of corn have been obtained after it; nay, instances have occurred, in which a complete ploughing, that was given with a view to eradicate it for corn, has renovated this plant to such a degree, that it was left again for another series of years.—Those of our agricultural readers, who wish to acquire more minute information relative to the management of lucern, will consult Mr. Harte's classical work above-mentioned, and also Mr. Rocque's *Practical Treatise on Cultivating Lucern Grass* (8vo. 1s. 6d.) in which this interesting subject is fully discussed, while its advantages and expences are fairly appreciated.

Lumbago. See Rheumatism.

Lunacy. See Madness.

LUNGS, in anatomy, denote the two viscera or lobes in the cavity of the breast, by which we breathe. They are connected with the neck, and situated on the right and left side of the heart. Being furnished with innumerable cells, which are formed by the descent of the wind-pipe into the lungs, those bronchial tubes communicate with each other; and the whole appears not unlike a honey-comb.

The most important use of the lungs is that of *respiration*, by which the circulation of the blood is supposed to be effected; and by the consequent alternate pressure of the different parts of the lower belly, the digestion of food is promoted. Besides, not only the expulsion of the feces and urine greatly depends on the constant action of the lungs, but likewise the sense of smelling is enjoyed by inhaling the air; and it is chiefly by the organic structure of these vessels, that mankind are enabled to speak.—Lastly, they perform the office of excretion, and expel those useless matters which, if retained in the system, would be productive of fatal consequences.

The organs of breathing are subject to various affections, such as Asthma, Catarrh, Cough, &c. which are discussed in their alphabetical series. Hence, we shall at present treat only of the *Peripneumonia*, or Inflammation of the Lungs.—This dangerous affection manifests itself by a moist cough, in which the expectorated matter is frequently streaked with blood; by an obtuse, dull pain under the breast-bone, or between the shoulders; anxiety and difficulty of breathing; the face is swelled, and appears of a purplish hue. It chiefly attacks persons of gross habits, who eat strong food, and drink viscid liquors: it is generally fatal to the asthmatic, especially if they be of an advanced age.

Causes: An inflammation of the lungs is not always a primary disorder, but more frequently is the consequence of a quinsy, pleurisy, catarrh, and other diseases. It also arises from an obstructed perspiration induced by cold; from the wearing of wet clothes; from too violent exercise; fractures or other injuries of the ribs; suppression of the itch, rose, and other cutaneous eruptions; as well as from the exhalation of noxious or sulphureous particles; and lastly, from worms.

The peripneumony is divided

into the *spurious*, which is occasioned by pituitous or viscid matter obstructing the lungs; and the *catarrhal*, which may originate from any of the causes already specified, but more especially from a defluxion of thin acrid matter on these organs. The treatment of both, however, being similar, we shall briefly state the chief points relative to this subject.

Without exception, the most efficacious remedy in pulmonary inflammation is blood-letting, which may be performed in either arm; and the quantity of blood to be taken away must be in proportion to the patient's strength.—Leeches may also be advantageously applied; and, if a large portion of blood is to be drawn, it will be safer to have recourse to cupping and scarification, as nearly as possible to the part affected. Next to bleeding, the antiphlogistic or cooling regimen should be strictly adhered to; the patient not be indulged in feather-beds, or warm couches, as long as he can support himself; and warm diluent drinks, impregnated with vegetable and nitrous acids, should be given in copious draughts.

Poultices and fomentations have also been applied to the painful side with considerable success; but the repeated use of blisters has been found more effectual. Much, however, depends on an easy expectoration, for which purpose linseed-oil, or other mucilaginous demulcents, are eminently serviceable. De Haen recommends the use of oil mixed with opium; Dr. Hamilton found the latter drug, when combined with calomel, to be very beneficial in this and other inflammatory diseases; and his experience of this medicine has been amply confirmed.

Among the various remedies proposed with the view of affording relief in the commencement of this formidable disease, few have been more efficacious than the steam of warm water impregnated with vinegar, and copiously inhaled by means of Dr. Mudge's machine, of which we have already given some account, in p. 451 of our 1st volume.—One of the most powerful expectorants, however, appears to be the tartarized antimony, given in very small or nauseating doses. And, as inflammations of this nature frequently terminate in what are called *critical* and spontaneous sweats, these ought to be cautiously promoted, but without the aid of stimulant medicines.—Lastly, the diet cannot be too slender; it should, indeed, consist chiefly of weak broths, slightly acidulated with the juice of oranges or of lemons; and the patient's drink ought to be thin water-gruel, sweetened with honey, or a decoction of liquorice, the roots of fennel, and the like, in which a small portion of currant, or similar jelly, may be dissolved.

Inflammation of the Lungs, in *Farriery*, a disorder to which horses are occasionally subject. It is indicated by the animal's restlessness, as he never lies down during the prevalence of this malady: his fever is violent, and he breathes with difficulty. The mouth is generally open, whence a kind of ropy slime flows copiously, while a viscid reddish or yellowish water runs from his nose, and likewise adheres to the inside of his nostrils.

The first remedy in this complaint is bleeding: three English quarts of blood should be taken from the animal, on the first day; and four pints, on the succeeding morning. If the unfavourable symptoms do not abate, it will be necessary to draw blood repeatedly, one quart at a time; but, if the creature be old or weak, the bleedings ought to be sparing in quantity, and more frequently repeated. Next, some sweet hay and bran should be cut very small, scalded together, and placed in the manger, in order that the fumes may be inhaled. Mr. TAPLIN directs this *internal fomentation* to be attended to every fourth or fifth hour, and the following decoction to be immediately administered:—Let six ounces of pearl-barley, a similar quantity of split raisins and Turkey figs cut in slices, and two ounces of bruised stick liquorice, be boiled in a gallon of water, till the liquid be reduced to three quarts. It is then to be strained, and a pound of honey added, while it is hot; and, as soon as it is cold, a pint of distilled vinegar. Of this decoction he prescribes one pint to be given, with the addition of an ounce of nitre, every fourth, fifth, or sixth hour, according to the greater or less urgency of the symptoms.

Should the disease progressively become more obstinate, and the animal be costive, a clyster ought to be given; consisting of two quarts of common gruel, six ounces of coarse sugar, four ounces of Glauber's salt, two ounces of tincture of jalap, and a quarter of a pint of olive-oil. This injection is to be repeated once in twenty-four hours, or oftener, if necessary. But, if the virulence of the disorder abate in consequence of these applications, the subsequent treatment may be similar to that stated in p. 82 of our second volume: beside which, one of the following balls may be administered every morning, for a fortnight:—Take Castile soap, six ounces; gum ammoniac, two ounces; anise seeds and cummin seeds, of each four ounces, in powder. These ingredients are to be incorporated with a sufficient quantity of honey to form a mass, which should be divided into twelve balls. — The horse's diet, during the progress of the disease, ought to consist of warm mashes of scalded bran, sweetened with four ounces of honey; while his common drink may be thin gruel, in each draught of which two ounces of cream of tartar should be dissolved. These preparations, however, may be gradually relinquished, as the animal recovers; and the mode of treatment be varied as circumstances may require.

LUNGWORT, or *Pulmonaria*, L. a genus of perennial plants, comprising six species, three of which are natives of Britain: the principal of these is the *officinalis*, Common Lungwort, Spotted Lungwort, Cowslips of Jerusalem, or Broad-leaved Lungwort; growing in woods, and flowering in the months of April and May. This species is eaten by sheep and goats, but is not relished by cows, and totally refused by horses and hogs. It is cultivated in gardens, on account of its leaves, which, in a fresh state, possess a slightly astringent and mucilaginous taste. They are recommended in tickling coughs, pulmonary consumption, &c. but are more useful as a culinary vegetable, and as salad, especially in early spring.

When burnt, the common lungwort

wort affords a larger proportion of ashes than almost any other plant; the produce, in general, amounting to one-seventh part of its weight.

LUPINE, or *Lupinus*, L. a genus of exotic plants comprising nine species, most of which are cultivated in gardens, on account of their beautiful flowers: they are raised from seed, which may be sown in any open borders, where they thrive, and present a pleasing variety.

The seeds of the WHITE LUPINE *(Lupinus albus)* have a leguminous, though disagreeably bitter taste, and are said to be vermifuge; both when taken internally, and applied externally. Some authors, however, suppose them to be of a poisonous nature; yet such seeds were much used by the Greeks as an article of food, and have been recommended by GALEN as affording wholesome aliment.—In the Transactions of the Patriotic Society of Milan (vol. ii. p. 243, Ital. edit.) there is an account of the manner in which this plant may be converted into *cordage* or ropes, and likewise into *paper*.—BECHSTEIN says, that its flowers furnish the bees with abundance of honey.

LUTE, a composition of certain viscid or tenacious matters, which becomes solid, when dry; and which, on being applied to the junctures of vessels, closes them so effectually as to prevent the admission or egress of air.

Though lute is chiefly used by chemists, it also comprehends any species of cement, applied to vessels, or furnaces, which are exposed to an ardent heat. It is variously prepared of rye-flour and water; quick-lime and the whites of eggs; iron filings, brick-dust, and linseed-oil; potters' earth, river-sand, horse-dung, pulverized glass, or flocks of wool mixed with salt-water, or bullocks' blood. The best lute, however, and which is most easily procured in London, is *Windsor-loam*: it should be moderately stiff, so that, when moistened with water, it may be pressed into the side, or crevices, of the furnace, &c. As soon as the clay begins to dry, it must be beaten closely down to the sides, and the fissures repeatedly filled up, till the whole be perfectly closed.

The late Dr. BLACK recommended a simple mixture of sand and clay, as preferable to any other composition. The proportions for resisting the violence of fire are, *four* parts of sand to *one* of clay; but, if the lute be intended for lining or coating furnaces, he directs *six* parts of sand to be taken to one of clay, in order that the contraction of the latter may be effectually prevented. This compound is to be applied in a manner similar to that above stated, but it must be allowed to dry for a considerable time; after which a fire may be kindled, and the furnace gradually heated for one or two days. The heat should then be raised to the highest degree of intensity, by which the *luting* will acquire the hardness of free-stone, and afterwards be as durable as any other part of the furnace.

LUXATION, signifies the dislocation of any bone out of its natural articulation, so as to impede or destroy its proper motion. The general symptoms of this complaint are, inability to move the injured limb; pain; tension; and deformity of the part affected: it is also frequently attended with inflammation and fever.

In the treatment of simple luxations, if the contiguous skin and muscles be much inflamed, leeches ought first to be applied, and the dislocated limb kept in the most easy posture, before the reduction of the bone can be attempted; because the stretching of a limb, while the surrounding muscles are in a state of inflammation, may prove highly injurious: the upper part should likewise be held steady, while the surgeon is replacing the bone. And, as the contractile power of the muscles frequently resists every mechanical effort, they ought to be previously relaxed by emollient poultices or fomentations, in consequence of which the bone may be easily replaced.

After the operation, the limb must be kept in a relaxed state, and the bone supported with a bandage, till the parts have recovered their proper energy; but, where any visible inflammation remains, it will again be requisite to apply leeches.

If dislocation be accompanied with a fracture near the joint, such injury must be allowed to heal previously to reducing the bone. Where, however, any tumor or collection of matter near the joint is the cause of *luxation*, this affection may be considered as incurable; but, if it proceed from too great relaxation of the ligaments or tendons of the joint, the complaint has frequently, though gradually, been removed by supporting the limb with a proper bandage; by the use of the cold bath, and by electricity.—During the whole period, between the setting, and healing of a luxated bone, the patient must preserve the disordered part in a state of rest; subsist on mild but nutritious aliment; and carefully avoid the influence of the depressing passions.

LUXURY denotes voluptuousness, or an extravagant indulgence in whatever pleases the senses, such as the articles of food, dress, and equipage.

The utility or detriment of luxury to a State, is a subject on which great difference of opinion prevails among political writers. Nor is it easily decided, whether this predominant feature in mankind may with more propriety be called the offspring of vice or folly; but luxury doubtless increases in proportion to the influx of trade; and, though it may by prescription be justifiable at court, in public officers, or on particular occasions, yet in private individuals it will ever remain an object of just reproach. For, by increasing the expences of a family, it presents an insuperable bar to matrimonial establishments, and thus contributes to the depopulation of a country. Farther, it impairs the health and ruins the constitution of its votaries; and, as the opulent leave their rural seats, in order to reside in cities, such change is attended with many bad consequences to themselves, as well as to their numerous domestics. Thus, the country is in a manner deserted; and thence we may account for the long train of evils arising from the indolence and libertinism of a city-life.

One of the most pernicious consequences resulting from the rapid progress of luxury, is the *high price of provisions*, which is, in a great measure, occasioned by the keeping of useless servants, as well as of unnecessary horses: these partly consume, and partly waste, such a portion of food as might be more beneficially employed in the support

port of the industrious poor.—Lastly, though luxury be the attendant on wealth; though it encourage arts, manufactures, agriculture, and commerce; and, when its prevalence does not corrupt the morals of a people, becomes a national benefit, by diffusing riches among all ranks, and enabling the poor to to pay the most exorbitant prices of provisions; yet we presume to say, that the greatest benefit would result from the observance of *sumptuary laws*, which should limit the expences of individuals from exceeding a certain point; because that money, which is at present spent in the purchase of articles not strictly necessary to domestic life, might thus be diverted into its proper channel, and be more generally circulated throughout the country.

Lyme-grass. See Lime-grass.

LYMPH, a tasteless transparent liquid, that is absorbed from the surface; the cellular texture; as well as the viscera and their cavities throughout the animal body: it is conveyed into the thoracic duct, or canal of the breast, by means of certain vessels, thence called *lymphatics*, or *lympheducts*.—The use of this organization is to return to the thoracic duct the superfluous nourishing fluid; the vapours of vascular cavities, and likewise all substances that are applied to the skin; from which circumstance some physiologists have conjectured the lymph to be the immediate matter of nutrition.

M.

MACE, the inner coat of the Nutmeg, is a thin unctuous membrane, of a yellowish colour, which it acquires by being dried in the sun. It is imported from India in flakes, about an inch in length, which present a variety of ramifications.

Mace emits a very fragrant, agreeable odour, and has a pleasant, though acrid and oleaginous taste. It is reputed to be an excellent carminative, and stomachic, possessing all the virtues of the nutmeg, but with less astringency. Its oil, whether distilled or expressed, is equally efficacious; and, when taken internally in doses of from one to five drops, frequently affords relief in colics. Externally, it is of great utility, if rubbed on paralytic limbs; it also promotes digestion, and often prevents vomiting and hiccoughs, on being applied to the region of the stomach.

Mace pays on importation a duty of 4s. 4½d. per lb. besides 11d. per lb. convoy-duty; and a drawback of 3s. 8d. is allowed on exportation; but, if brought from the British plantations in America, it is free from the charge of convoy.

Mad Dog. See Bite of a Mad Dog.

MADDER, or *Rubia*, L. a genus of plants, comprising nine species, one of which is a native of Britain, viz. the *R. tinctorum*, Wild, or Common Dyers'-Madder. It is perennial, and flowers in the months of June and July.

The most proper soil for the cultivation of Madder, in this country, is a soft sandy loam, that has been in a state of tillage for several years, and which is at least 2½ or 3 feet deep, being perfectly clear from all weeds. It is necessary to plough the land thoroughly, before the commencement of winter, during which it should be laid in ridges, in order to *mellow*; and early in the ensuing spring, this valuable plant is propagated from slips, carefully taken from the old roots: these slips ought, according to the late celebrated MILLER, to be set by the dibble, in rows at the distance of two or three feet from each other; though, in the opinion of BECHSTEIN, they should be planted only six inches asunder. And, as madder requires constant moisture, without which the young roots would shrivel and decay, it will be useful, before they are committed to the ground, to immerse them in a fluid paste made of the best garden mould and soft water. Besides, this transplantation should be undertaken only in rainy weather, or when there is reason to suppose that showers will speedily follow.

During the first summer, it will be sufficient to *scuffle* the plants with the *Dutch hoe,* as soon as the weeds appear: in the succeeding autumn, when the stalks or *haulm* begin to decay, they must be raked off the ground, and the intermediate spaces carefully dug with a spade, or turned up with a hoe-plough, the soil being laid over the roots or heads of the plants in a roundish ridge. In the ensuing summer, the same management must be repeated; but, before the ground between the plants is hoed, the haulm must be laid over the next intermediate space for two or three weeks, at the expiration of which it should be turned back again on those intervals which have been hoed; care being taken to *scuffle* the soil, so that all weeds may be eradicated. In the following autumn, the haulm must be cleared, and the mould thrown up in ridges, similar to those of the first year.

Early in the third spring, before the young sprouts appear, the ground should be well raked; and, as soon as they are ready to be removed, they must be carefully taken off, at a distance from the crown of the parent plant. The culture of madder, during this summer, varies little from that of the two preceding, the plant only being earthed up somewhat higher; as it has now acquired more strength. As soon as the haulm begins to decay in autumn, the roots must be taken up, carefully dried under an airy shed; whence they should be conveyed as speedily as possible to a kiln; and managed in a manner similar to that followed with malt or hops; because the beauty of the colour greatly depends on the expedition with which it is prepared. From the kiln, the madder is conveyed to the *pounding-house,* where it is pulverized; in which state it is fit for use.

Madder is employed in considerable quantities for dyeing a fine red colour, and likewise as a first tint for several other shades:—if wool be previously boiled in a solution of alum and tartar, and then immersed in a hot decoction of tartar only with this drug, it will acquire a very durable, though not beautiful red tinge.

M. MARGRAAFF obtained from madder a permanent *lake* of a fine red colour, which is applicable to every purpose of painting. He directs two ounces of the purest alum to be dissolved in three quarts of distilled water previously boiled in a clean glazed vessel, which is to be set over the fire. As soon as the solution begins to simmer, it ought to be withdrawn, and two ounces of the best Dutch madder added; after which the mixture is to be boiled once or twice, removed from the fire, and filtred through clean white paper. The liquor, thus strained, is now suffered to subside for a night; when the clear fluid must be poured into the glazed pot, heated over the fire, and a strained solution of salt of tartar gradually introduced, till the madder be wholly precipitated.—This mixture is next to be filtered, and boiling distilled water poured on the red powder, till the fluid no longer acquires a saline taste. It now remains only to dry the lake, which will be of a deep red colour; but, if two parts of madder be used to one of alum, the shade will be still deeper; and, if one part of the latter article be added to four of the former, it will produce a beautiful rose-colour.—See also Red.

The root of the Common or Wild Madder, is an excellent detergent and aperient; on which account it has been highly recommended in visceral obstructions, particularly of the uterus; in coagulations of the blood, induced either by falls or bruises; in the beginning of dropsical complaints; and especially in the rickets.—It may be given pulverized, in doses from 5 to 15 grains to children, and from half to a whole dram, three or four times a day, to adults. When taken internally, it possesses the remarkable property of tinging the urine with a deep red colour; and produces similar effects on the bones of animals, if eaten among other food.

Madder-roots pay, on importation a duty of 5s. 1½d. per cwt. and are subject to a convoy-duty of 2s. 3d. per cwt. The same duty is paid for the drug imported in a manufactured state.

This root forms an important article for dyeing; and, in order to encourage its cultivation, the 31st Geo. II. c. 35, subjects persons convicted of stealing or destroying madder-roots, to make satisfaction for damages, at the discretion of the magistrate, for the first offence; or, in case of non-payment, the convict is liable to be committed to the house of correction for one month, or to be whipped; for the second trespass, such offender is to be confined in the house of correction for three months; provided the prosecution be commenced within thirty days.—Those who wish to acquire a more intimate knowledge of the culture, &c. of this profitable drug, will be gratified by the perusal of Mr. Miller's "*Method of cultivating Madder*," &c. (4to. 1758, 2s. 6d.) in which the subject is clearly treated, and illustrated with plates.

Madnep. See Cow-parsnip.

MADNESS, or *Mania*, one of the most distressing afflictions which humbles human nature. It is usually divided into two kinds, *melancholy*, and *raving*; but as they are so nearly allied to, and frequently alternate with each other, we shall treat of both in one connected view.

The distinguishing character of melancholic patients, is a gloomy and dejected countenance, for which no real cause can be assigned. They are seized with fear and trembling, so that it is difficult to raise their animal spirits. The violence of the disease depends on the different subjects that prey upon the mind, which is extremely variable; inquiring after the most trivial matters: the habit is costive, the face pale, the pulse small and weak, while the stomach is distended with flatulency, and the appetite is uncommonly voracious. With respect to those strictly denominated *maniacs*, their condition may be ascertained by their bold and resolute aspect, while their eyes are suffused with blood; by the tremulous motion of the eyelids; an unaccountable aversion to particular persons or things; acuteness in hearing; and by their almost continual wakefulness. Those hapless individvals who have become *raving mad*, in consequence of fear, generally continue under the influence of that passion.—Such are the more striking symptoms, which vary towards the decline of the disorder; the victims of which are dull and stupid; or sorrowful, melancholy, and sensible of their mental derangement.

Causes:—These are various, and often complicated, but may be aptly divided into two classes, namely, *mental* and *corporeal*. To the former belong love, fear, terror, pride, hope, joy; too ardent enthusiasm for liberty, or other passion that absorbs every faculty of the mind; too intense or too long continued meditation upon any person or subject; an ill-founded dread of the divine vengeance, occasioned by superstition, or false principles of religion, &c. Among the *corporeal* causes are blows, wounds, ulcers, bruises, or water in the head; congestions of blood in the brain; phrensy, or inflammation of that part, from whatever accident; too sedentary a life; the taking of poisons possessed of narcotic powers; suppression of the proper or natural evacuations, of cutaneous or other disorders; sensual excesses; schirrous or glandular obstructions of the mesentery, &c.—Madness is in certain families hereditary; and a slight degree of it is sometimes perceptible after the small-pox, intermittent, nervous, or other fevers.

Peculiarities:——Uncommon strength of limbs; almost total insensibility not only to cold, but likewise to stripes, however severe; and an inability to support the exhalations of aromatic substances. As the disease is periodical, the patient is particularly affected during certain changes of the moon, and in the spring. Farther, maniacs are not liable to be attacked by any of the prevailing epidemics; on the contrary, they are frequently cured of their former complaints, or the progress of such disorders is at least suspended, during the continuance of their insanity.

Cure:—If madness be the consequence of any other malady, its removal should be attempted by nourishing diet; clear air; gentle exercise, and the moderate use of wine. But, where this disease is hereditary, or has gradually increased from the patient's infancy, it becomes incurable: a similar fate generally awaits those persons, whose violent attacks, from whatever cause they may originate, have resisted every effort of art, beyond the space of twelve months.

In the earlier stages of madness, blood-letting, either in the arm or jugular vein, according to the strength of the patient, has been found eminently serviceable; but, if he be weak, or much exhausted, leeches may with advantage be applied to the temples. Considerable benefit has likewise been derived from emetics, such as ipecacuanha for more weakly constitutions, and antimonial wine, or tartarized antimony, for the more robust. The hot-bath; partial or total immersion in cold water, unexpectedly; purgatives; diuretics; and vitriolated tartar, have all been found occasionally useful in the progress of this disorder. Camphor has also been highly recommended; but it does not appear to be very efficacious. According to Dr. Locker, distilled vinegar has been successfully given to maniacal patients, whom it throws into profuse perspiration; and he observed, that they more speedily recovered, when the sweating was excessive, and of long continuance.

Formerly, the deplorable victims were chained, and scourged, lest they should injure themselves and others:—a more humane treatment now prevails, and we trust that the *strait waistcoat* will always render such harsh conduct unnecessary, as it answers every purpose of restraining them from mischief. It will, however, be advisable uniformly to maintain an ascendancy over the patient, by a commanding deportment; as he will thus be impressed with a due sense of subordination, and submit to whatever regulations may be adopted for his safety, or restoration. Independently of this coercive treatment, attempts have been made to mitigate the violence of the disorder, by the liberal use of narcotics, especially of opium, which others have forbidden, as tending to increase the derangement. Instances, however, have occurred, in which large doses of that drug have effected a cure, when administered both externally and internally; either alone, or combined with camphor and nitre.—Professor Hufeland observes, that tickling the nostrils with a feather dipped in laudanum, has afforded great relief during a fit of furious madness.—A pillow stuffed with fresh hops has also, in many instances, composed the patient, and induced a salutary sleep.

The diet of persons labouring under this dreadful malady, ought to be uniformly light and thin; their meals should be moderate, and consist for the most part of nutritive vegetable food, especially during a course of physic. Their hours of employment must be regular, and their amusements adapted to their natural disposition: lastly, when the disease appears to be subdued, it will be requisite that the patient drink the chalybeate waters, and resort to the cold bath; as both remedies are eminently calculated to strengthen his whole frame, and to secure him against a relapse.

MAGGOT, the common name of the fly-worm generated in flesh, from the egg of the large blue flesh-fly, known under the name of *blue-bottle.* Its body is white and fleshy, destitute of legs or feet, and composed of a number of rings, similar to those of caterpillars; and the insect is capable of assuming various figures, being at times more or less extended in length, and consequently of a greater or smaller size, according to its different contraction.

Although we are not acquainted with any remedy, by which meat or cheese infested with maggots may be recovered, and rendered fit for use, yet we shall suggest a simple expedient for preventing the generaneration of such vermin.—In hot climates, where the flesh of animals undergoes putrefaction within a few hours, it will be advisable to cover the meat with the leaves of the Swallow-wort *(Stapelia variegata* and *hirsuta)*, natives of Africa; or with those of the Fetid Goose-foot or Orache *(Chenopodium olidum)*, either of which possess a very fetid smell, that attracts the oviparous flies to deposit their eggs on these leaves, mistaking them for putrid flesh; but, as the young brood cannot subsist on vegetable food, they speedily perish.—FUNKE remarks, that a couple of flies, according to a probable computation, may produce in one year, two millions of descendants.

MAGISTERY, a name given to almost every precipitate obtained by solution, as opposed to *calx*, which is procured wholly by calcination: it is chiefly employed to denote such precipitates as are used in medicine; for instance, the magistery of bismuth, coral, crabs-eyes, &c.

Magistery of Bismuth is a fine powder, prepared by dissolving bismuth in nitrous acid, and pouring on it a large quantity of pure water, which precipitates the magistery to the bottom of the vessel. It is chiefly employed as a cosmetic by the gay and giddy, on account of the superior beauty and dazzling whiteness which it imparts; but it is very pernicious to health, and eventually injures the skin.—See BISMUTH.

Magistery of Coral, crabs-eyes, pearl, shells, chalk, and other absorbent matters, is prepared by dissolving any of these substances in the nitrous acid; when they must be precipitated by fixed alkali, and repeatedly washed in pure water, till the latter is perfectly tasteless.

Magistery of Lead is the calx of that metal, dissolved in aqua-fortis, and precipitated with filtred salt-water, by which means the powder acquires a beautiful white colour. It is softened by repeated ablutions, and then mixed with pomatums for improving the skin and complexion of the face.—Like all other preparations of lead, this magistery is a *slow poison*, and will therefore never be used by those who have the least regard for their health.

MAGNESIA, or *Magnesia alba*, a kind of absorbent earth, first discovered in the commencement of the 18th century. When pure, it is extremely white, loose, and light, being infusible, as it resists the heat of the most powerful burning lens. This earth, however, easily melts with borax; and is divested of its fixed air by calcination: in this state, it is less soluble than before, and does not effervesce with acids, but it may be safely taken internally.

Native magnesia is not found in quantities sufficiently large and pure for general use. It is therefore prepared by dissolving separately equal portions of Epsom salt and pearl-ashes, in double their quantity of warm water, when the sediment is to be strained: the two liquids are now to be mixed; adding eight times their proportion of warm water. The whole is suffered to boil a few minutes, being carefully stirred with a wooden spatula, to prevent the powder from adhering to the bottom of the vessel. Now the liquid is to stand at rest, till the heat be somewhat diminished, when it should be filtered through a cloth, on which the magnesia will remain: lastly, it is to be washed till it be totally divested of its saline taste.

White magnesia is of considerable service for preventing or removing many disorders of children, especially of such as are troubled with a redundance of acid in the first passages; for which purpose it is preferable to the calcareous absorbents. But even magnesia is frequently misapplied, and ought never to be given to infants disposed to flatulency, or where no symptoms of acidity can be discovered; as it is otherwise apt to lodge in the bowels, and produce obstinate costiveness; being in itself an inactive earth, unless combined with acids. Hence it is often, and very properly, conjoined with rhubarb; so that children above one year old may take from five to ten grains of the former, and from one to two grains of the latter; while adults generally require one or two scruples of magnesia, and from five to ten grains of rhubarb for a moderate dose.—See also HEART-BURN.

MAGNET, or LOADSTONE, a kind of ferruginous stone, which in weight and colour resembles iron ore, though it is somewhat harder and more ponderous. It is occasionally discovered in iron mines, being sometimes in large masses of different forms and sizes, that are partly magnetic, and partly metallic. Its colour varies according to the country whence it is obtained; the best magnets, which are imported from China and Bengal, are of a deep blood-colour; those of Arabia are reddish; those of Macedonia, blackish; and such as are found in Germany, Hungary, England, and other parts of Europe, have the appearance of unwrought iron.

The distinguishing properties of the magnet are, 1. Its attraction of iron, as well as every matter containing ferruginous particles; and 2. Its inclination to the poles. Hence it is of essential service in navigation, and is employed in constructing the mariners' needles, both horizontal and inclinatory.—As this subject, however, is but distantly connected with our plan, we shall merely state the most simple method of making *artificial magnets*, which possess the virtues of the genuine loadstone, and have been found very useful in extracting particles of iron from the eye, and other delicate parts of the human frame.—CAVALLO directs the scales, which fall from red-hot iron, when hammered, to be reduced into a fine powder, and mixed with drying linseed-oil, so as to make a stiff paste; when it may be moulded into any form required. This mixture is to be put in a warm place for some weeks, till it become perfectly dry, and hard; after which it may be rendered powerfully magnetic by the mechanical application of the magnet. But this friction of the two metals should be performed in a direct horizontal line from north to south; by which simple process, if continued for a sufficient length of time, even two flat pieces of iron or steel may be easily imbued with the magnetic fluid, so as to evince, in a considerable degree, the properties of the genuine loadstone, without having been touched by the latter.

In order to increase the attractive power of the native magnet, it is frequently *armed*, that is, cased, capt, and provided with thin iron plates or bars, after its poles have been polished and properly regulated. Thus, it will support a weight 20, 40, nay 100 times greater than it could bear in its natural state; and, by loading it with ponderous bodies, its force, instead of being diminished, is considerably improved. On the contrary, by charging a loadstone with an inadequate weight; exposing it to heat, rust and lightning; by keeping it in an improper direction to the poles, or frequently dropping it on the floor, its virtues will soon be diminished.

MAGNETISM, Animal, a sympathy which was lately believed to subsist between the magnet and the human body; and, in consequence of which, the former was supposed to be capable of curing almost every disease.

This fanciful system was originally invented by Father Hehl, of Vienna, though first brought into general notice, in 1776, by M. Messmer, who realized a princely fortune in France, by imposing his doctrines on the fanatical and credulous: his pretended mysteries were at length completely developed by a committee of learned and ingenious men, who were appointed to investigate his pretensions. Although this successful juggler refused to explain the principles of his art, yet from the account of one of his most eminent pupils, it appears, 1. That animal magnetism is an universal fluid, pervading the whole creation, and forming a medium of mutual influence between the planets; and also between the earth and animal bodies. 2. It is the most subtle fluid in nature, being capable of flux and reflux; and of receiving, propagating, and continuing all kinds of motion. 3. That the animal body is subject to the influence of this fluid by means of the nerves, which are immediately affected by it. 4. It operates at a distance, without the intervention of any person. 5. That, notwithstanding its universality, there are certain animal bodies, which are not equally susceptible of this fluid, and the presence of which even destroys the effects of animal magnetism. Lastly, it cures all nervous disorders *immediately*, and others *mediately*: in short, its virtues extend to the universal cure and preservation of mankind!

Such are some of the principles of this wild and incoherent system, the fallacy of which has been so clearly pointed out, that we should have consigned it to oblivion, had not a similar farce been lately obtruded, and is still operating, on the biassed part of the public. We allude to certain metallic, or even wooden, points, which professedly charm *all pain* from the bodies of animals, in whatever part it may be situated.—How is it possible to believe such absurdities, even though apparently corroborated by the testimonies of titled and untitled fanatics?

Magnifying Glass. See Microscope.

MAGPYE, or *Corvus pica*, L. a crafty, and well-known British bird, which is about 18 inches in length, and weighs from eight to nine ounces. It has a black bill, wings, and tail; but the latter are variegated with white, green, purple, and blue of different shades.

Magpies construct their nests with art, making a thorny cover, and leaving a hole at the side for admittance: the female deposits six or seven pale greenish eggs, thickly spotted with black. Similar to the crow, this bird feeds indiscriminately on both animal and vegetable substances; and, like the raven, it steals shining objects, such as buttons, knives, coins, and precious stones; which it carefully conceals in its nest.—Magpies not only destroy young ducks and chickens, but suck and empty the eggs in a hen's nest. When reared from nestlings, they become exceedingly familiar, and learn to talk many sentences, as well as to imitate every noise within hearing.—For the best method of taking them, we refer to the article Crow.

MAHOGANY, or *Swietenia*, L. an exotic tree growing wild in South America, and likewise in the islands of Cuba, Jamaica, Hispaniola, and in those of Bahama. It was formerly very common in Jamaica; whence it was first imported to London in the year 1724; since which period it has been very generally employed for household furniture. Lately, however, it has become more scarce and expensive; because the low-lands in that island have been gradually thinned of those valuable trees which could be readily carried to market, or transported on ship-board.

The mahogany tree grows very tall and straight, frequently among bare rocks, and attains a size of four feet in diameter: its wood is hard, admits of a fine polish, and is excellently calculated for chairs, tables, desks, and similar articles. It also affords strong and durable timber, and is usefully employed in the West Indies for beams, joists, planks, boards, and shingles. Ships built of this wood are said to be almost impermeable to cannon balls, which lodge in the wood, or, if they pass through the planks, occasion no splinters.—The fresh bark of this tree has often been used in medicine, as a substitute for the Peruvian, and with equal success.

Many attempts have been made for painting or staining inferior woods, so as to resemble in grain and colour that of mahogany. As our own experiments have not afforded us complete satisfaction, we shall communicate the following recipe, which is extracted from the Hanoverian Magazine (in German) for 1786:—Take the planed boards of the elm or maple-tree; moisten them first with diluted aqua-fortis, and when dry, varnish them with a tincture made of two drams of dragon's-blood, one dram of alkanet-root, and half a dram of aloes digested in eight ounces of proof-spirit: by applying this liquor two or three times, with a sponge, or soft painter's brush, it is said to produce the desired effect.

MAIDEN-HAIR, the Common, Miltwaste, or Spleenwort, *Asplenium Trichomanes*, L. an indigenous perennial plant, growing on old walls, rocks, and shady, stony places; flowering from May to October.—Its leaves have a mucilaginous, sweetish, sub-astringent taste, without any peculiar odour: they are reputed to possess considerable efficacy, in disorders of the breast proceeding from viscid and acrid humours, when taken in the form of an infusion or decoction: hence they have been recommended for promoting the expectoration of tough phlegm, and removing obstructions of the viscera.

MAIDEN-HAIR, the Great Golden, or Goldilocks, *Polytrichum commune*, L. an indigenous perennial plant, growing in woods and moors, in wet, boggy places; flowering in the months of May and June.—The branchless stem of this moss frequently attains the length of 18 inches; and, being covered with many long and soft leaves, it may be advantageously employed for besoms and brushes.—LINNÆUS remarks, that the wandering Laplanders construct their couches of this elastic vegetable; and, according to STELLER, the inhabitants of Kamtschatka employ these stalks as wicks in their lamps made of earthen ware.

MAIZE, GUINEA-WHEAT, or INDIAN CORN, *Zea Mays*, L. a native of North America, where it is cultivated to a considerable extent, and forms an important article of food.

Maize is propagated by setting the seed in equi-distant rows, from two, three, to five feet asunder. In America, it is planted from the beginning of March to the end of May, or the commencement of June; but the most proper season is towards the middle of April. For this purpose, the earth is opened with a hoe to the depth of three or four inches, and in each hole are deposited four or five grains, at a little distance from each other.

As soon as the young plants appear, the weeds are carefully eradicated, and the earth gradually heaped around them, till the ears appear; after which they are left till the harvest arrives. The ears are then gathered, and dried in an open situation; for, if this corn be heaped together, it is apt to ferment and putrefy, or to sprout and grow.—The best method of preserving it is, to thresh it out, as soon as the harvest is completed, to dry it perfectly in the sun, and deposit it in cool, dry, and airy situations.

This valuable plant produces a much larger number of ears, which abound with a greater proportion of wholesome, mealy matter, than any European grain; and, as Indian corn prospers in low, swampy situations, where it tends to dry up the superfluous moisture, and to render the soil firm, we conceive it may be advantageously cultivated in the southern counties of Britain.

Maize is subservient to a variety of purposes: its bulky stalks afford an excellent winter-food for cattle; provided they have not been cut in too dry a state. The American Indians parch the corn carefully over a fire, without burning it; after which they pound it, sift the meal, and preserve the latter for their constant provision. The more civilized colonists prepare excellent bread from Indian wheat, by kneading the flour into a stiff paste, either alone, or mixed with that of rye or wheat, which is fermented with leaven or yeast, and then regularly baked. They also convert the maize into a species of malt, from which, as well as from the bread itself, they brew a wholesome beverage.

MALLOW, or *Malva*, L. a genus of plants consisting of 53 species, four of which are natives of Britain: the principal of the latter is the *sylvestris*, Common Mallow, or Mauls, growing in hedges, footpaths, and among rubbish; flowering from June to August.—The leaves of the Common Mallow possess a mucilaginous, sweetish taste, and were formerly often used in food, with a view to prevent costiveness. At present, decoctions of this plant are sometimes prescribed in dysenteries, and urinary complaints; though it is chiefly employed in emollient cataplasms, clysters, and fomentations.—The flowers are eagerly visited by bees, which obtain from them an abundant supply of honey.

All the species of mallow, both indigenous and exotic, are beautiful plants, well calculated for ornamenting gardens, and affording grateful food to cattle; as they may be easily propagated by seed. But there are three, viz. the *Crispa*, or Curled Mallow; the *Peruviana*, or Peruvian Mallow; and the *Mauritiana*, or Mauritian Mallow; which, when macerated like hemp, afford a thread much superior for spinning, to that obtained from the latter vegetable; and the cloth made of the three species before mentioned, is said to be more beautiful than that manufactured of flax. From the curled mallow, which produces the strongest and longest fibres, excellent cordage and twine have been procured; and M. DE LISLE fabricated a new kind of paper from different species of the mallow, which not only served for the purposes of writing and printing, but also appeared to be eminently useful for drawing, and for the hanging of apartments.

MALLOW the *Marsh*. See MARSH-MALLOW.

MALT, denotes barley prepared for brewing, so as to produce, by fermentation, a potable liquor, known under the different names of BEER, ALE, and PORTER.

The operation of *malting* is performed by steeping any quantity of good barley, newly threshed, in a leaden cistern containing river water, for the space of three or four days, or till the fluid acquires a bright red colour: but a more eligible method is that of changing the water every day, till the grain is sufficiently macerated, so as to *slip* out of the husk, when compressed between the fingers. It is then removed from the cistern, and laid in heaps to drain for two or three hours, at the end of which it is stirred, and formed into a new heap. In this state, the grain is suffered to lie for more or less than forty hours, till the malt is properly *come*; during which interval, it will be necessary to examine the barley at the expiration of 15 or 16 hours, because the grains generally begin to sprout about that time. Within an hour after the roots appear, the heap must be carefully stirred, so that the whole may equally germinate.

The malt is now to be spread out, and repeatedly turned over, for the space of two or three days, in order that it may properly cool; in consequence of which process it becomes mellow, dissolves easily in brewing, and readily parts with the husk. To complete the process of malting, the barley is thrown up into a high heap, where, in the course of 30 hours, it becomes as hot as the hand can bear it, by which both its sweetness and mellowness are improved. Lastly, the malt is dried in a kiln, heated with coke, charcoal, or straw: the intensity of the fire varies according to the colour required; but, where wood or other vegetable fuel is employed, such materials ought to be perfectly dry; as otherwise the smoke arising from damp combustibles would greatly injure the grain.

In order to *determine the quality of malt*, a handful of it should be thrown into cold water, where those grains that are imperfectly germinated, will swim with one end upwards (Dr. Darwin supposes with the root end); and such as are properly malted, float on their side; whereas sound, ungerminated barley, uniformly sinks in water. Another criterion of good malt is, its agreeable saccharine taste; and, likewise, if the whole contents of the grain easily crumble into powder, and dissolve in the mouth. In short, it ought to be pure, dry, and to emit a strong, though agreeable, odour.

Mr. Bordley, an intelligent American farmer, advises his countrymen to buy malt, or exchange barley for malt, rather than to attempt the making of it; as the principal difficulty he found was in ascertaining the *heats* of the grain, while germinating. At length he succeeded, on attending to the directions given in the 5th vol. of Mills's *Husbandry*. This practical writer observes, that during the first ten days the heat of the malt on the floor should be between 50 and 60 degrees of Fahrenheit's thermometer; in the next three or four days, it is to be increased from 60 to 65 and 67°; and during the last ten days of its lying there, to 80, 84, and 87°; which last will be the proper degree of heat, when the malt must be laid on the kiln.

After the malt is properly ground in a mill, it is fit for Brewing; of which process we have already given an account under that article.

Malt-dust, or the refuse that falls from malt in drying, affords an advantageous manure for wheat-land, especially if it be scattered as a *top-dressing*: The proper quantity of this dust is 80 bushels per acre for wheat, and about 60 bushels for barley: it is also eminently calculated for grass-lands; and, if applied in the latter proportion, it will produce a very considerable increase of the best seed. Such manure, however, is most beneficial to clay-soils, or stiff loams; as, on gravelly land, and in dry seasons, it will be apt to burn the soil. But, if the succeeding weather be moist, it will be productive of great benefit; for the first shower washes it into the earth, and thus secures the crop, which not only becomes finer and more abundant, but the soil is at the same time effectually cleared from the noxious weeds, that frequently vegetate, when common dung is employed.

As malt forms so essential an article of domestic consumption, and is not at all times within the reach of the poor, various recipes have been given for making beer with a small portion of, or wholly without, malt: some of these having already appeared in pp. 237-8, of our first volume, we now add the following method of brewing beer, as tending to diminish the consumption of, and thus in some measure to serve as a substitute for, that valuable grain. It consists simply in adding 28lbs. of dry, well-tasted brown sugar, to half a load, or three Winchester bushels, of malt. The latter is to be brewed in the usual manner with hops, after which the sugar is to be introduced, and the liquor stirred till the whole is dissolved. Thus, a wholesome beverage may be procured at about three-fourths of the expence usually incurred by using malt and hops only; because a smaller proportion of the latter plant now answers the purpose.

Among the different patents that have been granted for inventions, or improvements, relative to the preparation of beer, the following claim more particular notice; namely, Mr. Dearman's, for his contrivance of mills for grinding malt, in 1779; Mr. Jones's, in 1798, for a machine, calculated to mix malt, or other substances, more intimately with fluids; and Mr. Tickle's, in 1801, for more effectually dissolving and extracting the virtues of malt, hops, and other vegetable substances. As our limits will not permit us to detail these pretensions to ingenuity, we refer the reader to the later volumes of the *Repertory of Arts and Manufactures*.—In the 15th volume of the same work, we meet with a communication from Mr. Joseph Coppinger, containing a description and plan of a malt and corn-kiln of his invention. He observes, that it is particularly adapted to the use of farmers, who frequently lose considerable quantities of grain during damp or wet seasons, for want of a similar contrivance. Its advantages are stated to be: 1. That it may be erected either in a loft or on the ground-floor, and at one tenth part of the expence. 2. Any kind of fuel may be employed without detriment to the malt or corn dried in it. 3. The heat will be more uniformly distributed, without any waste, as is the case with most of the common kilns. Lastly, the health of the attendants, necessarily employed, will not be exposed to certain injury, in consequence of their breathing, or sleeping in an unwholesome atmosphere; as their beds will be placed in a shed on the outside of the building. This circumstance, being of the greatest importance, deserves serious attention; and we trust that the contrivance here suggested, will be generally adopted. Consistently with our limits, however, we are obliged to refer the inquisitive reader to the volume last mentioned, where the whole process is amply described, and illustrated with an engraving.

Several acts of parliament have been passed, with a view to prevent frauds in the making of malt, which is subject to a duty of sixpence per bushel; and, by the 31 Geo. III. c. 30, §. 15, every kind of malt is prohibited to be imported, on pain of forfeiting both the vessel and cargo, though it may be admitted into British ports provisionally, as His Majesty shall think proper.

Malt-spirits. See Spirits.

MAN, the chief of the animated world, is distinguished from all living creatures by his superior faculties; being possessed of reflection, thought, a power of invention, and an ability of carrying his conceptions or designs into effect. Formed for society, he seldom lives in solitude: and as an emanation of divine light appears to direct all the *good* actions of mankind, we excel every created being, while we enjoy the exclusive faculty of communicating our ideas, by speech as well as by letters.

Men are divided into classes, chiefly by their colour, that varies according to the situation of the country in which they reside.—See Complexion.—Their bodies are erect, and seldom exceed six feet in height; they are almost naked, excepting a few hairs; and, though Nature has refused a general covering of the skin, man still remains her master-piece; as, conformably to Sacred History, he is the last work that proceeded from the hands of the Creator. The form of his body; the powers of his mind, supported by that innate spirit which governs (or at least ought to guide) his actions, and to which the faint appellation of *Reason* has been given; together with his discernment of good and evil;—all evince his superiority over the whole animal kingdom.

With all these advantages, however, mankind labour under innumerable wants, which the present work is designed to supply; namely, as far as respects domestic and rural affairs, as well as other subjects more or less connected with animal economy.—To describe the various parts of the human frame, is the province of anatomists; and, as it would be foreign to our plan to discuss the social, moral, religious, and political relations of man, we trust the present brief sketch will suffice. Let it, however, be observed, that the generality of mankind have no reason to complain of the shortness of their existence; for, as they receive, at their birth, the germ of a long life, it must be attributed partly to their own neglect, partly to the concurrence of accidental and extraneous causes, which they cannot prevent or foresee, that they do not attain such an age as their natural constitutions may seem to promise. Hence we ought to be very circumspect in our family connections, and modes of living; because, it is either from a blind choice in the former, or an imprudent conduct in the latter respect, that so many are the victims of hereditary disease.—See LIFE, and LONGEVITY.

MANDRAKE, or *Atropa mandragora*, L. an exotic plant, growing in Spain, Portugal, Italy, and the Levant: it is propagated by seeds, and treated in a similar manner with the more tender exotic plants.—According to BECHSTEIN, the carrot-like root of the Mandrake, in its native climate, penetrates from three to four feet deep into the soil, where it remains sound for fifty years.—The plant is divided into *male* and *female*, the vegetation and growth of which are alike in both; though the leaves, roots, and seeds of the latter are longer, narrower, and of a darker colour than those of the male.

The fresh root of the mandrake is a powerful purgative, and may be taken in doses of from ten to twenty grains in substance; or from half a dram to a dram in infusion. It has been found very serviceable in hysterical complaints, but ought to be cautiously used; for, if administered in too large quantities, it occasions convulsions, and even proves deleterious.—The mandrake possesses narcotic properties, and is sometimes employed in emollient cataplasms and fomentations, for discussing hard tumors and swellings.

MANGANESE, or *Magnesia nigra*, a dark-coloured native mineral, found in a more or less impure state, both in iron-mines, and in the lead-mines of Mendip-hills, in the county of Somerset.

Common manganese is very heavy, moderately hard, and of a deep dusky grey, approaching to black, but sometimes of an iron-brown cast. It emits sparks with great difficulty, when stricken against steel; nor does it effervesce with acids, though the latter make a partial solution of it when calcined.

Considerable quantities of manganese are employed in glass-works for purifying glass; as it destroys the effects of colouring substances, and renders vitrified matters perfectly clear; from which property it has received the appellation of *Soap of Glass*. Farther, it imparts to a large quantity of glass, in a state of fusion, a purplish or reddish tinge, that disappears if continued in the fire: these colours may, according to CRONSTEDT, be easily effaced by the calces of arsenic or tin.—Manganese likewise communicates various tints to warm water, such as green, purple, red, blue, &c. which change on agitating that fluid.—When distilled with the muriatic acid, or spirit of salt, this mineral yields the oxygenated muriatic acid, or *Bleaching Liquor* of BERTHOLLET.—It is also employed for glazing earthen-ware, which thus acquires a black colour.—After being calcined in a strong fire, it has been recommended medicinally, as an astringent; of which, however, we have had no experience.

MANGE, a disease affecting dogs and swine, in a manner similar to the itch in the human body; and arising from an insect that works its way beneath the uppermost skin; where it causes so great an irritation, that the animals rub or scratch themselves, tearing off the head of the pustule, which occasions a scab and, in a short time, an ulceration. This disorder, especially in dogs, originates from too high feeding, want of exercise, and an opportunity of refreshing themselves with dog's-grass; from being starved at home, so that the animals are compelled to devour carrion, and excrements abroad; from want of water, or neglect of cleanliness in their kennels. It is induced in swine, by suffering them to lie in their styes, without clearing away their ordure.

As the malady is entirely situated in the skin, the cure may be effected in dogs, by giving them a small quantity of fine pulverized sulphur, either in milk, or incorporated with butter, and rubbing them daily, for the space of a week, with an ointment consisting of sulphur and hog's-lard; to which should be added a small portion of oil of turpentine. Another remedy is obtained by boiling four ounces of quicksilver in two quarts of water, till the quantity be reduced to one half: with this liquid the animals are to be washed regularly, and ought also to take a small draught of it every day, during the continuance of the eruption.

With respect to the mange in hogs, Dr. NORFORD (*Annals of Agriculture*, vol. xv.) recommends the following ointment, which seldom fails to effect a perfect cure, provided it be properly applied, and the animals be kept clean, after the disease is removed:—Take three ounces of hog's-lard, one ounce of fine flour of sulphur, two drams of white hellebore, newly pulverized, and half an ounce of the water of kali, prepared in the shops. These ingredients are to be thoroughly incorporated, so as to form an unguent; the whole of which is directed to be rubbed on the animal at one time, and is said to be sufficient for a hog of six or seven stone: if the ointment be properly applied, there will be no occasion for any repetition.

tion.—Should, however, a slight cough affect these quadrupeds, after the cure is performed, it will be necessary to give each, according to its size, from half an ounce, to an ounce and a half, or even two ounces of crude antimony, properly levigated and mixed with some of his daily food, for the space of ten days or a fortnight; by which simple remedy, the hogs will be effectually restored.

When these animals have been long neglected, their necks, and various other parts of the body become affected with loathsome chaps or cracks. In this case, the best remedy is, to anoint the ulcerated parts every three or four days, till they are healed, with a little tar-ointment, prepared by dissolving equal parts of tar and mutton suet over a gentle fire, and straining the mixture, while hot. But the most certain preventive of the mange, and its subsequent disagreeable effects, is the strictest attention to the health and cleanliness of the animals. For this purpose, every part both of the kennel and of the stye ought to be thoroughly swept, before they are littered with fresh straw; nor should a clean bed be spread over a foul or dirty one, as is too frequently the case with careless or negligent servants; who, regardless of their master's interest, thus eventually cause the destruction of many valuable dogs and swine.

Mange, in *farriery*, a cutaneous disease, to which horses are occasionally subject: it arises from poor feeding, and is therefore chiefly found in such cattle as are kept by the lower classes of people.

This disorder is easily known by the tawny appearance of the skin, which is thick, and full of wrinkles, particularly on the mane, loins, and tail: the ears and eye-brows, as well as the diseased limbs, are totally divested of hair; while the little, still remaining on those parts, is very stiff and bristly.

If the mange be contracted by infection, it may be easily removed by anointing the horse daily with a salve prepared of sulphur and hog's-lard; at the same time giving him sulphur and antimony for some weeks, after the eruption has disappeared. But, if the disorder originate from low feeding, and thin, impoverished blood, the diet must be changed, and the horse allowed a proper quantity of sweet hay and corn. Hence the animal's food should consist of warm mashes composed of equal parts of malt, or oats, and of bran, to each of which ought to be added four ounces of honey, and one ounce of sulphur. These are to be given every night and morning, for the space of a week or ten days, during which the horse should receive a measure of dry corn at noon: an ounce of nitre is likewise to be dissolved in water, and given every night and morning, during the taking of the mashes. At the expiration of that period, his diet should be changed to good oats and sweet hay; the corn be moistened with water, and a dose of the following mixture incorporated with it, every night and morning: Take a pound of sulphur, and an equal portion of prepared antimony; let them be well mixed in a mortar, and divided into twenty-four doses.

With respect to the external treatment, every infected part ought, previously to the commencement of the mashes, to be carefully washed with a pailful of warm water, in which a quarter of a pound of soft soap has been dissolved, so that all scurf and filth may be completely removed. The animal is then to be gently dried, and on the succeeding morning, every disordered limb is to be anointed with the following preparation :—Take half a pound of strong mercurial ointment; three ounces of pulverized white hellebore; one ounce of black pepper in powder, and a similar quantity of oil of tartar. The whole must be incorporated with a sufficient quantity of sweet-oil, to give it a proper degree of softness; and the unction should be repeated for seven, or ten days, or even a fortnight, according to the urgency of the symptoms, or the virulence of the eruption. The powders of sulphur and antimony, as well as the nitre, ought to be continued for three weeks, or a month; and, lastly, when the horse appears sufficiently invigorated, he should lose a small portion of blood, and afterwards swallow, at different times, two mild purgatives, by which a complete cure will be effected.

MANGEL-WURZEL, or ROOT OF SCARCITY, the *Beta altissima*, L. is an exotic variety of the *Beta Cicla*. It is propagated from seeds, one or two of which are deposited, in the month of April or May, in holes dibbled at the distance of from eight to eighteen inches asunder.

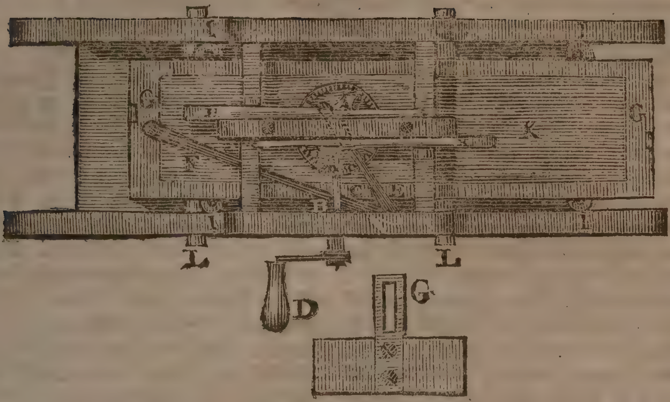
The white and red-streaked roots of this plant are large and fleshy; affording excellent fodder for cows, to whose milk and cream they communicate a delicious flavour.

The Mangel-Wurzel produces abundance of leaves, which are greatly relished by horses, sheep, cows and hogs; for the two last mentioned animals, however, it is necessary to cut them off the plant; because they are said to refuse eating the fresh herbage from the roots. These leaves, being remarkably tender, are dressed on the Continent in the same manner as spinach.—See BEET and SUGAR.

In those parts of Germany where the Root of Scarcity is cultivated, farmers prefer it to potatoes, turnips, carrots, and every other vegetable for feeding cattle; as both its root and leaves are free from the depredations of insects; but they acknowledge, that the animals do not fatten so readily on this as on the vegetables above specified.—Although the Mangel-Wurzel has not answered the high expectations that were formed of its utility in Britain some years since, it is a valuable plant, and deserves the attention of agriculturists; as there is no doubt that in certain soils, and in particular situations, it may prove a most useful article for the purposes above stated.

MANGLE, a valuable domestic machine, employed for the purpose of smoothing such linen as cannot be conveniently *ironed.*

Various patents have been granted for improvements in this machinery: but, as they are not expired, and too complicated to be understood without the aid of engravings, we have annexed the following cut, representing an improved mangle contrived by Mr. JEE, of Rotherham; to whom the Society for the Encouragement of Arts, &c. in 1798, voted their silver medal, for his ingenuity displayed on that occasion.



Description of Mr. Jee's *improved Mangle.*

A, the great wheel, which, in machines of a full size, is 15 inches in diameter.

B, the arbor, on which the nut, C, is fixed.

D, the handle of the winch.

E, the crank, 21 inches in length.

F, the rod of the crank.

G G, represent the hollow studs, by which the ends of the bed are lifted up.

H H, the levers.

I I I I, the four pullies fixed on the moveable bed K.

L L, the ends of the rollers.

The small figure in this cut represents a front view of one of the hollow studs G, to shew its form, when standing at the end of the bed; and into which the levers enter alternately, as often as it becomes necessary to elevate the bed, in order to put in, or take out, the rollers.

Mr. Jee's mangle is so constructed, that the handle requires to be turned one way only, in consequence of which the machine moves with greater facility, and with incomparably less injury to the linen, than by varying the turnings, and in a manner cutting the different folds. Besides, it possesses the great advantage, that a woman and one boy are sufficient to work it, and can perform as much labour in the same period of time, as three or four persons with mangles of the common construction.

MANGO-TREE, or *Mangofera*, L. a native of the East Indies, whence its unripe fruit, preserved in vinegar, is imported under the name of *mangoes*.

This lofty tree attains a considerable size: its fruit, when fully ripe, is as large as a goose egg, and greatly esteemed in the East, on account of its invigorating odour, which is said to restore the health of persons in a declining state.—Beneath its rough shell, there grows a kernel similar to that of almonds, and which may be eaten either fresh, or preserved: from the expressed juice, the Indians prepare wine; and the remainder produces excellent flour.

Every attempt to propagate the mango-tree in Europe, has hitherto failed; and MILLER is of opinion, that the stones will not vegetate, unless they be planted shortly after the fruit is ripe. He therefore suggests the expedient of importing the young plants from India, in boxes filled with earth; so that they may afterwards be kept in the tan-bed of a hot-house.

MANNA, the juice obtained from several species of ash, particularly the *Fraxinus rotundifolia* and *Ornus*, growing in Italy and Sicily. When naturally concreted on the tree, this juice is called manna in the *tear*; but, if it exude on straws or chips of wood affixed to the tree for that purpose, it is called *canulated*, or *flaky* manna.

This drug, commonly sold in the shops, is obtained by making incisions in the tree, after the spontaneous exudation has ceased: it consists of larger masses, and is of a deeper red than that which flows without wounding the tree.

The best Calabrian manna is imported in oblong, light, friable flakes, or pieces, of a whitish, or pale yellow shade, and somewhat transparent. The inferior sorts are moist, unctuous, and of a darker colour.

Manna is a mild and agreeable laxative, which may be safely administered to children and the aged; though, in some constitutions, it is apt to induce flatulency, and to distend the bowels; but this inconvenience may be remedied by the addition of a little cinnamon water, or other warm aromatic. The dose for children is, according to their age, from one to three drams; and for adults, one ounce, or one ounce and a half: as, however, its operation, when taken by itself, is very mild, and sometimes imperceptible, it is generally given in laxative mineral waters, or combined with salts, senna, rhubarb, or similar aperient medicines.

Lastly, we can speak from experience, that *manna* is one of the most useful demulcents in the humid asthma, and similar pituitous as well as inflammatory affections of the breast; that it beneficially promotes expectoration, and is of peculiar service in the second stage of the small-pox, or during the suppuration of the pustules.

MANNERS. See Good Breeding; vol. i. p. 338.

MANSLAUGHTER, a species of homicide, denotes the unlawful killing of another, without any malice, either express or implied: it may be perpetrated either *voluntarily*, in consequence of a sudden dispute; or *involuntarily*, though in the commission of some unlawful act. Thus, if two persons rashly quarrel and fight, so that one of them kill the other, the act is *manslaughter*: the case is similar, if they go out into a field to fight, because it is one continued scene of passion; and our law does not consider a hasty and deliberate deed in the same scale of guilt. Farther, if a man be grossly insulted by another pulling his nose, and if he immediately kill the aggressor, it constitutes only manslaughter; though the act cannot be justified on the plea of self-defence, because there is no absolute necessity for doing it with a view to self-preservation. It must, however, be remarked, both in this and every other case of homicide in consequence of provocation, that if there be sufficient time for the heat of passion to subside, or for reason to interpose, and the offended person take away the life of the offender, such act is *deliberate revenge*, and is accordingly punished as *murder*.

Involuntary manslaughter differs from excusable homicide in this respect, namely, that the latter always happens in consequence of a lawful act, but not so the former. Thus, if a person perform a lawful act in an improper or illegal manner, and without sufficient caution; for instance, when a builder or workman throws down a piece of stone or timber into the street, which kills a person, such act shall be construed either manslaughter, or murder, according to the particular circumstances under which it was committed. Hence, if the accident happen in a village where few persons pass, and the workman had given previous notice, it is simply a *misadventure*; if in London, or any other populous city, where numberless persons are passing and re-passing, and due warning had been published, it is *manslaughter*; but, if no notice whatever had been given, and such workman knew of people going and returning, it is then *murder*; because it is a proof of malice against all mankind.

The crime of manslaughter is felony within the benefit of clergy, and the punishment inflicted is, burning in the hand, and forfeiture of all the offender's property. There is, however, one species, which is deservedly punished as murder, being deprived of the benefit of clergy by statute; namely, the stabbing of a person mortally, even though the deed be perpetrated upon sudden provocation: but an exception is made by the 1 Jac. I. c. 8, in favour of self-defence, without intent to commit manslaughter. See also Duel.

MANUFACTURE, signifies a commodity, or piece of workmanship, produced from raw materials, whether by hand, or by the aid of machinery.

The extensive utility of manufactures to a commercial nation, is generally acknowledged; and it is a circumstance worthy of remark, that the greatest improvements have, in general, proceeded from persons of no liberal education.

Manufactures, it is true, furnish employ for numerous families, but at the same time they greatly contribute to that depravity of manners for which the labouring classes are, at present, but too conspicuous. Indeed, it is a melancholy fact, that so long as agriculture is but *partially* attended to, and in a manner neglected, for the *more speedy* acquisition of wealth, the progress of luxury necessarily tends to change the most virtuous habits, and to vitiate the morals of a mercantile nation.

By the 23 Geo. II. c. 13, it is enacted, that if any person export the tools or utensils used either in the silk, linen, or woollen manufactures, he incurs a forfeiture, and the sum of 200l.; and, if the captain of the ship be acquainted with such illegal proceeding, he is liable to pay a fine of 100l.—The forfeiture of the articles, and of 200l. is farther imposed on all persons collecting them for the purpose of exportation; and, if any captain of a King's ship, or officer of the customs, knowingly suffer such exportation, both (by the 21 Geo. III. c. 37), incur a penalty of 200l. lose their employment, and are for ever incapacitated from holding any office under government. This act likewise subjects all persons having tools in their possession, or procuring them to be made, with a view to exportation, to the forfeiture of the same, as well as of the sum of 200l. and to imprisonment for the term of 12 months. Lastly, the 22 Geo. III. c. 60, declares, that every person exporting such tools, shall forfeit them, together with the sum of 500l.

MANURE, denotes any substance employed for improving land, whether by remedying its natural poverty, or by correcting its too great stiffness, looseness, or other qualities unfavourable to vegetation. It is usually divided into four classes, viz. Animal, Vegetable, Fossil, and Fluid.

I. Animal Manures comprehend the several parts of animals, such as their fat, dung, urine, &c.

1. *Dung.*—Having already pointed out the general properties of dung, under that article, we shall only observe, that the excrementitious matter of privies is supposed to exceed every other kind of manure, during the first year it is applied; in the second, its beneficial effects are less evident; and, in the third year, they almost entirely disappear. The quantity necessary for land in a good condition is, by Mr. Middleton, computed to be about two loads per acre, annually; which, in his opinion, will always preserve its fertility. He farther remarks, that exhausted ground may be perfectly restored, by laying on four or five loads of night-soil per acre, for the first year; after which, two loads annually will be found amply sufficient to keep the land in the highest degree of cultivation.

2. *Fish.*—Herrings, pilchards, and mackerel, afford an excellent manure; being chiefly used in those parts of Britain where they are caught in the greatest abundance, and seldom fail to produce rich crops.—In some parts of Cambridgeshire, stickle-backs (*Gasterosteus aculeatus*, L.) are employed for the same purpose, in the proportion of twenty bushels per acre: and, if it were possible to introduce the Caviar (which see) into British seas, this measure would be highly beneficial to agriculture.

3. *Bones*, to which we refer.

4. *Urine* is well calculated for manure: it is so far preferable to dung, as no seeds of weeds are deposited in the ground with the former; and, if the land be well watered with this fluid, such irrigation will be attended with the best effects.

5. *Horn-shavings*. See Horn.

6. The *chippings* or scraps of skins and hides (being the refuse of furriers and curriers) are of great utility on land intended to be sown with wheat or barley. They should be scattered by hand on the soil, and speedily ploughed in; because any pieces, left on the surface, are immediately devoured by crows and dogs. The proper quantity of this manure is, two or three quarters per acre, which should be scattered a short time before the seed is committed to the ground:—such chippings are peculiarly calculated for light, dry soils, but are seldom productive of any benefit to wet, or clay lands.

7. *Sheep's-trotters*, and fellmonger's cuttings, are employed on similar soils, though in the proportion of from 20 to 40 bushels per acre. They should likewise be ploughed in, to prevent the depredations of dogs and crows.

8. The soiled or damaged *locks of wool*, or trimmings of sheep, deserve to be more generally known as a fertilizing article: they are at present chiefly used in the county of Surrey, for ameliorating the hop-grounds.

9. *Woollen rags* are an excellent manure; but, instead of being collected in a heap, similar to a dunghill, they ought to be cut into small pieces in a paper-mill; strewed by hand; and ploughed in, three months before wheat or barley is commonly sown: the usual quantity is from six to ten cwt. per acre; though, in the county of Kent, a ton weight is spread on each acre every third year, for hops. On account of retaining their moisture, such rags are eminently adapted to dry, gravelly, or chalky soils; the fertility of which will thus be considerably increased, especially during dry seasons. The only obstacle to their more general adoption, appears to be the apprehension entertained by many farmers, of catching the small-pox by chopping and scattering the rags; but, since the virulence of that disorder may be subdued by inoculation, those fears are certainly groundless.

10. *Insects*. See p. 20, of the present volume.

II. Vegetable Manures are either whole plants, or parts of vegetables, together with their ashes, &c. which are sometimes ploughed in, while growing, and are afterwards burnt, or otherwise decomposed.

1. *Wheat-straw*, according to Mr. Bordley, is a very valuable article; but it ought to be ploughed in, "when it is *muck-wet* from soaking rains that have softened it;" for, if it be turned into the ground under less favourable circumstances, it is seldom of any advantage.

2. *Weeds*, such as dock-roots, cabbage-stalks, the roots of couch-grass, &c. are of great service: hence Dr. Darwin pertinently remarks, that they should not be improvidently thrown into the highway, or consumed by fire, as too frequently happens: on the contrary, if laid on the ground in heaps, occasionally turned over, and covered with soil, they will inevitably perish, and speedily ferment, on account of the sugar and mucilage which they contain. The decomposition of weeds is still more effectually accelerated, on adding quick or newly-burnt lime, by which they are rapidly converted into a most valuable manure. For this purpose, Mr. Henry Browne, an ingenious chemist of Derby, directs a layer of green vegetable matter to be formed, about one foot in thickness, on which a very thin stratum of pulverized lime is to be scattered; and such alternate layers are to be continued till the pile is of a sufficient height. When these materials have lain together for a few hours, a dissolution of parts will commence; and, in order to prevent the inflammation of the whole mass, a few sods, or a small portion of fresh vegetable matter, ought to be added. In the course of twenty-four hours, the process will be complete, when a quantity of excellent ashes will be ready to be laid on the land. Weeds and vegetables of every description, if used green, will answer the same purpose, and thus be productive of double advantage to the farmer; because they may not only be collected at a small expence, but

will in a few years render his farm more valuable, by exterminating all noxious plants.

3. *Sea-weed* is a valuable manure for garden-grounds, and destroys every kind of vermin. The best is cut from the rocks on the sea-coast; but, as this marine vegetable is frequently thrown on shore, it may be useful to state, that the better kind resembles the haulms of peas; and the inferior sort is known by its long, shrub-like stalk: they may be either spread on the land in a fresh state, or previously laid up in heaps, and suffered to putrefy.

River, or pond-weeds, and especially the *River-conferva*, are equally beneficial; being particularly calculated for turnips or wheat, if ploughed in upon a sandy soil; but they produce no effect on land that abounds with springs, or is liable to inundation: the quantity laid on, varies from twelve to fourteen loads per acre.

Considerable benefit has likewise been derived from turning in vetches, buck-wheat, or rape, upon old-ploughed lands, which are thus greatly improved.—Turnips, when injured by the frost, may also be employed as a valuable manure; because they are believed to prevent the germination of the seeds contained in weeds, which enter the heaps of dung; and, when stirred among the latter, promote their putrefaction.

4. The *ashes* of fern, stubble, peat, &c. of which we have already treated in p. 126 of our first volume.

5. *Peat* is not sufficiently known as an article of manure. It is usually employed in a burnt state, for a *top-dressing*; but, as it is formed of the solid parts of morasses, and consists of vegetable fibres, more or less decomposed, it may be laid on clayey soils with the greatest advantage.—Dr. DARWIN remarks, that peat ought to be considered as an inestimable treasure to the farms in its vicinity: he suggests the propriety of throwing it previously into heaps, either with or without the addition of lime; then exposing it to the air, and draining the water from it, in order to expedite its decomposition.

6. *Rape-cake*, which is obtained after expressing all the oily particles from rape-seed: it affords, when pulverized, an useful manure for wheat.—*Rape-dust* is equally serviceable as a top-dressing for turnips; and should be spread on the land in the proportion of 10 cwt. per acre.

7. The bark of oak, or rather *tanner's waste*, which has been suffered completely to putrefy, affords an excellent manure for cold, stiff, clay-soils; one load being more efficacious than a double quantity of the richest dung.—If oak-bark be designed for grass-land, it ought to be spread shortly after Michaelmas, that the winter-rains may wash it into the ground; for, if applied in the spring, it will burn the grass, and exhaust, rather than ameliorate the soil, for that season. On the contrary, if intended for corn-fields, it should be spread immediately before the last ploughing, in order that it may be turned down, so as to come in contact with the early fibres or roots of the corn; because, when lying too near the surface during the winter, it unnaturally hastens vegetation; and, with the approaching spring, the young buds of the grain will perish from the severity of night frosts.

III. FOSSIL MANURES consist of various kinds of earth, sand, chalk, marl, marle, &c. all which, in a greater or less degree, contribute to the amelioration of land. See CRAG, CLAY, CHALK, GYPSUM, LIME, MARLE, and SAND.

1. *Coal-ashes* (see p. 20, and foll. of our 2d vol.) are of extensive utility as a manure. They are particularly adapted to clay-lands, for correcting their cold, ungenial quality; but they should not be ploughed in too deep. These ashes may likewise be employed as a top-dressing for clover, on dry chalky lands, over which they ought to be scattered in the months of March or April, in the proportion of from 50 to 60 bushels per acre: they have also been advantageously spread on *sward* or grass-lands, either in the winter, or during the spring.

2. *Soot*, which will be discussed in its alphabetical place.

3. *Clay*, when previously calcined or burnt, improves cold, wet, sandy soils; and has been found very serviceable to close, stiff lands. The excellence of this manure is very conspicuous in the North Riding of Yorkshire, where the ground is so sandy as to produce, with any other manure, only rye; with clay, it yields abundant crops of oats, barley, &c. The usual proportion, laid on meadow, pasture, or corn lands, is from ten to twelve loads per acre; and so permanent are its fertilizing properties, that it becomes unnecessary to repeat the operation of *claying*, for the period of forty-five years.

4. *Sand*, to which we refer.

5. *Salt* is justly asserted to be one of the most grateful manures to vegetation, as cattle are not only more healthy, but fatten more speedily on pastures, where it has been properly scattered. It is of great utility for raising turnips, as well as for producing abundance of corn; the straw being strong; the grain *thin-hulled*, heavy, and, on the whole, better than that from many other manures. Besides, it sweetens sour pastures; improves and increases the herbage; while it destroys all noxious insects. The proper quantity is sixteen bushels per acre; for, if a larger proportion be used, its beneficial effects will be diminished, and vegetation be eventually destroyed.

IV. FLUID MANURES comprehend WATER; Oil-COMPOST; MUD (which see); and all liquid matters that are employed with a view to ameliorate land.

Under the article IRRIGATION, we have treated of the utility of water, and pointed out the best manner of applying it to the soil: we shall, therefore, at present, only remark, that the *liquor of farm-yards* has been successfully tried on meadows, and wheat-fields, both of which were thus rendered uncommonly fertile. This fluid may also be used with great advantage for land sown with barley, oats, or other grain; but, if it be intended for grass-lands, it ought to be sprinkled on them only during the winter, when the rains wash the saline particles into the soil; or early in the spring, when the ground is laid up for hay; because no cattle will feed on the grass, while the salt or dung adheres to the blade.—Farther, it will be necessary to convey this ameliorating liquor to the field during dry weather, when the dung-water in the reservoirs is of a deep brown colour, and strongly impregnated with salt. Thus, the land may be irrigated as often as occasion may require; and the pools kept constantly empty, for the reception of fresh fertilizing matter.

As manure promotes the growth of plants; as its fermentation and warmth disposes the soil for the more easy admission of nourishing moisture from the air; and as it thus eventually contributes to the support and comfort of mankind, the manner in which it is to be applied, merits some attention.

Every kind of manure, Mr. BORDLEY justly observes, ought to be carefully collected, duly sheltered, and ploughed in, as speedily as possible after it has been carried to the field; the implements and labourers being ready on the spot. He directs the loads to be ranged in *lengths*; the dung to be spread and immediately ploughed in, "line by line;" because it more readily dissolves in the ground when newly covered, and its whole strength is thus secured to the soil.

Where the manure collected in heaps is to be ploughed under clayey soils, that are liable to become too solid and impenetrable to the fibres of wheat, or other plants; and also, where potatoes, or similar bulbous roots, are intended to be turned in, with a view to produce a crop beneath the soil; Dr. DARWIN conceives the most advantageous method of using such compost would be, to bury it before it is perfectly decomposed; for it will thus prevent the surface of the land from becoming too firm: and, notwithstanding the putrefaction will consequently be somewhat retarded, yet the fertilizing substances will in the end totally decay, and afford to the roots an equal, though more gradual, portion of nourishment.—The most proper season for ploughing or turning in such manures, Dr. DARWIN agrees with Mr. BORDLEY, to be immediately before the seeds are sown, or the roots are set; because the atmospheric air, which is buried with the dung, in consequence of its union with carbon in the interstices of the earth, gradually evolves a genial heat, that greatly promotes vegetation.

With respect to those manures, which are to be spread on the surface of grass or other land, and which are called *top-dressings*, the most favourable season for applying them appears to be the early spring; when they should be spread over the soil in a state of coarse powder, or in small lumps which cohere but slightly; because the vernal showers will then wash them into the soil, so that the young stems of grass may easily penetrate.

As, however, the proper mode of collecting and preserving manures is attended with considerable expence, the most economical manner of distributing it, requires no common skill. This object is in a great measure attained by the drill-husbandry, the principal advantage of which consists in putting the manure into *drills*. Mr. PARKINSON (in his *Experienced Farmer*, vol. i. p. 32) directs such drills to be made at the distance of two feet from each other: thus, he sows wheat, peas, beans, and cabbages; from the result of which this intelligent cultivator maintains, that *four* loads per acre in the drill-husbandry, are equal to *sixteen* loads in the usual way of spreading it over the whole of the field.

Lastly, for situations where it is difficult to procure such manures as are conducive to the fertility of the soil, we shall communicate the following *chemical compound*, which was lately invented by Dr. Bahrens, a reputable German clergyman.—According to the theory adopted by the continental writers on agriculture, those substances which yield, or evolve, the largest quantity of *carbonic acid gas*, or inflammable air, afford the *principal matter of manure*. Consistently with this theory, Dr. Bahrens has liberally published an account of the mode of preparing and applying his newly-discovered preparation, of which the following is a correct translation :—Take half a peck of common salt, roast it in a pan till it ceases to crackle ; then put it in an old iron pot over a fire sufficiently strong to reduce it to a glowing and shining state, like a melted metal ; when it should be poured into another vessel for cooling. Thus it will form a hard stony mass, which must be broken into fragments, and immediately dissolved in three large pailfuls of boiling liquor from farm-yards, before the former has attracted any moisture. When it is completely incorporated, the whole is removed from the fire, and well mixed in a trough, with six pailfuls of good moor-earth taken from ponds, or of the richest mire collected under dunghills. Having prepared this mixture, it will be necessary to add such a proportion of wood-ashes as is required to convert the whole fluid mass into a thick paste. In order to conclude the process, two bushels of fresh unslacked lime should be procured, and disposed of in this manner : first, it will be necessary to make a hole in the ground for a reservoir, which ought to be capacious enough to hold all the ingredients ; and the sides of which are to be *lined* with bricks or stone-work, so as to be perfectly tight. A layer of the above described composition is now spread on the bottom of this subterraneous magazine, and immediately over it, a thin stratum of coarsely pounded lime-stone ; then again a similar portion of the former, and another of the latter, alternately, till the whole is properly arranged. This management, however, ought to be undertaken by *two* persons, and with the greatest expedition, to prevent both the fermentation of the materials from taking place too early, and the escape of the inflammable gas into the atmosphere : for the same reason, the surface of the compound, or the top of the reservoir, must be speedily covered with swards or turf, to exclude every access of air. After remaining at rest for a few days, the internal commotion and heat will cease ; and the whole be reduced to a dry, fine powder, which is fit for immediate use.—Dr. Bahrens directs such powder to be thinly strewed over the land, after the seed has been sown and once harrowed, so that it may be duly mingled with the soil by the subsequent operations of the harrow.—He observes, from repeated experiments, that this compound has been productive of great advantage, not only to every species of grain and garden-fruits, but also to meadows and pastures ; the quantity above stated, being sufficient to manure a whole acre (consisting of 180 poles or rods square, decimal measure), which nearly agrees with our computation of English acres. And, if this artificial composition be applied for *two* successive years, its fertilizing properties continue undiminished for the *three* subsequent crops ; so that the soil will thus be improved for *five* years, in a manner equal to that obtained from the richest dung.—We confess our inexperience of the effects of this remarkable compost; but, as it has the sanction of a respectable authority, and is not attended with any considerable expence (though the trouble of preparing it may, in this country, be a serious objection), we do not hesitate to recommend it to the attention of our practical agriculturists, whose skill and industry will doubtless enable them to overcome many obstacles.

MANUSCRIPT, signifies a book or paper written by hand, as opposed to those which are printed.

Having already pointed out, in the article Deed, the most easy method of restoring written characters that are almost obliterated, we shall at present state a simple contrivance by which, we believe, manuscripts may be rendered legible, though the letters be totally effaced.—First, let the obliterated paper be slightly moistened with a sponge dipt in cold water, after which some galls finely levigated, are to be sifted over the paper. When it is perfectly dry, the powder should be gently shaken off, or removed with a soft brush: thus part of it will adhere to the former outlines that still exist in the paper, and the letters will immediately re-appear.

MAPLE-TREE, or *Acer*, L. a genus of plants, comprising twenty species, of which the following are the principal, viz.

1. The *campestris*, or Common Maple, which is a native of Britain, grows in thickets and hedges, and flowers in the month of June.—The wood of this species is much used by turners, being far superior to that of the beech. When it abounds with knots, it is greatly esteemed by joiners, for the purpose of inlaying. On account of its lightness, maple-wood is also frequently employed for musical instruments: being remarkably white, it was formerly converted into tables, and other articles of domestic furniture, particularly cups; which last may be turned so thin, as to transmit light. But, at present, this tree is principally planted for hedges, and for underwood; because it is of quick growth, and affords excellent fuel.—According to Dambourney, a decoction of the bark of the common maple, imparts to wool, prepared in a solution of bismuth, a reddish-brown colour similar to that obtained from woad.

2. The *Pseudo-platanus.* See Sycamore-tree.

3. The *Saccharinum*, or Sugar-Maple, which is a large, beautiful exotic tree, frequently growing to the height of from 40 to 60 feet, and 2 feet in diameter. Its flowers appear early in the spring, and are succeeded by long winged seeds, which sometimes ripen in England. This species is cultivated to a very considerable extent in North America, for the sake of its vinous juice, which flows, on making incisions in the tree, for several weeks in the spring, and is by evaporation reduced to the consistence of a brownish saccharine substance, known under the name of *Maple-sugar.* Besides, the sap of this tree affords an excellent vinegar, and a very agreeable kind of melasses which Dr. Rush thinks, may be converted into a wholesome summer-beer.—It is remarkable, that the juice exuding from this

tree is sweeter and richer, in proportion to the greater or less quantity of snow fallen during the winter; and that it will flow, even during the latter season, when it is wounded sufficiently deep, and on its southern aspect.—As this valuable tree grows speedily; endures the coldest climates; and (if not drained of its juice), furnishes not only good timber, but also excellent wood for turnery and cabinet-ware, which is not liable to the depredations of the worm, its culture in Britain cannot be too strongly recommended.

MARANTA. See ARROW-ROOT.

MARBLE, in Natural History, a genus of stones that admit of a bright and beautiful polish: they are composed of small separate concretions, moderately hard; not emitting fire, when stricken against steel; effervescing with, and soluble in acids; and calcining in a moderate fire.

The finest modern marbles are those of Italy, Blankenburg, France and Flanders. In some of the Western Islands of Scotland, very fine specimens of this fossil have lately been discovered. When chemically examined, marble consists of calcareous earth united with fixed air; and is, like lime-stone, or chalk, convertible into a strong quick-lime.—Black marble derives its colour from a partial admixture of iron.

Staining of Marble.—The pieces to be coloured should be of the hardest kind; previously well polished; and be divested of every spot or blemish. Such only are calculated for supporting the heat which is always necessary, in order to open their pores, and render them susceptible of the colours. On the other hand, too low or too high a degree of heat are equally injurious: hence a due temperature ought to be preserved; and this, without making the marble red, will cause the liquor to boil on its surface.

The principal colours used for staining marble are, *red*, *yellow*, and *blue*: the two first of these tints may be imparted to it, by reducing dragon's blood, or gamboge to a powder, and grinding them separately with spirit of wine in a glass mortar. But, in experiments on a small scale, a little of either of those powders should be mixed with spirit of wine in a silver spoon, and dissolved over a charcoal fire. Thus, a strong tincture will be extracted; with which, by the aid of a pencil, the finest traces may be drawn on marble, while cold: on heating the latter in an oven, the marks will penetrate deeply, and remain perfectly distinct.

A fine *blue* colour may be communicated to marble, by a watery solution of the drug, known among dyers by the name of *Canary Turnsol*, and tracing the marks designed with a pencil. These will strike deeply into the stone, and the colour may be increased, by drawing the moistened pencil repeatedly over the same lines. The staining liquor must always be laid on, *cold*; nor should the marble afterwards be heated; yet such blue is apt to spread itself irregularly, unless its outlines be circumscribed by wax, or other adhesive matter. This colour possesses the advantage of being applicable to marble that has already been stained with other drugs: it affords, besides, a very beautiful shade, and is not liable to be easily effaced.

In 1778, a patent was granted to Mr. RICHTER, for his invention of an art or method of inlaying *scagliola*, or plaster in marble or metals, so as to imitate flowers, fruits, trees, birds, beasts, landscapes, and every kind of ornament. This patent is now expired; but, as it is practicable only by statuaries and artists, the inquisitive reader will consult the 10th volume of the *Repertory of Arts and Manufactures*.

For the easiest method of cleaning marble, or alabaster, see p. 25 of our first volume.

MARBLING, the art of painting or disposing colours, in such a manner as to imitate marble.

There are several kinds of marbled paper, which vary only in the forms or figures of colouring: some are dotted; others drawn in irregular lines; but the method of tinging them, simply consists in dipping the paper in a thick solution of gum tragacanth, over which the colours are uniformly spread, after having been ground with ox-gall, and spirit of wine.

The paper must first be immersed in clear water, the sheets regularly folded over each other, and covered with a weight. It is now to be carefully laid on the colouring solution, and pressed softly with the hand, that it may bear equally on the whole. Next, it must be suspended in order to dry; and, as soon as the moisture is evaporated, the paper is polished by rubbing it with a little soap, and smoothing it either with glass highly burnished, or with a polished agate.

The colours usually employed for red, are, carmine, lake, or vermillion;—for yellow, Dutch-pink and yellow ochre;—for blue, Prussian-blue and verditer;—for green, verdigrease, a mixture of Dutch-pink, and Prussian-blue, in various proportions;—for orange, the orange-lake, or a composition of vermilion, or red-lead, with Dutch-pink;—and lastly, for purple, rose-pink and Prussian-blue.

These different colours are first to be finely triturated with spirit of wine, when a small proportion of gall is to be added, and the grinding of the whole repeated. The proper quantity of gall can be easily ascertained by comparative trials; because there must be only such a proportion of it used, as will suffer the spots of the various tinging matters to unite, when sprinkled on the solution of tragacanth, without intermixing, or running into each other.—The whole being thus prepared, the solution is to be poured into different vessels, according to the colours employed, which are to be sprinkled on the surface; and the process of marbling is completed by laying the paper on the mixture, in the manner above directed.

MARE, the female of the horse kind.

Having already stated under the article HORSE, the proper management of mares, considered as beasts of labour, we shall at present give a few hints relative to their treatment, during the period of foaling.

Mares bring forth after a gestation of about eleven months. Before they are covered, it will be advisable to keep them in the stable for five or six weeks, during which time they ought to be fed with good hay, and sweet oats well sifted: in order to promote the object, about a quart of blood may be taken from each side of the neck, five or six days previously to their admission.

No mare intended for the stud should be less than six years old:

the most proper period for accomplishing the purpose, appears to be in the beginning of June, so that she may foal in the succeeding month of May; when the meadows will abound with rich grass, which contributes to the abundant secretion of milk; but Mr. Young (*Annals of Agriculture*, vol. 36) thinks it is more advantageous when they foal early, for instance, in February; or, which is perhaps still better, in January; though he assigns no reason for such opinion.

The management and diet of the animal should not be changed for three weeks or a month after covering; she ought likewise to be kept clean in the stable, and her feet should be well pared and thinly shod. To facilitate parturition, the animal's nostrils may be closed by hand, at the time of foaling; in order to prevent her from inhaling the air; and, if such expedient be ineffectual, a pint of warm ale should be given her, with a small quantity of madder.—If the mare be deficient in milk, it has been directed to boil as much as can be drawn from her, together with lavender leaves, and to foment the udder with this decoction while warm, till the knotty tumors that prevent the milk from flowing, be discussed. Her drink ought now, for the space of a month, to consist only of *white water*, that is, bran and water stirred together, till the liquor appear white. At the end of that period, a decoction of sulphur and savin should be given to the animal, which, as well as the colt, will thus be greatly invigorated.—See also Colt.

MARE's-TAIL, the Common, or *Hippuris vulgaris*, L. an indigenous perennial plant, growing in ditches and stagnant waters; it flowers in the month of May.

This weakly astringent vegetable is eaten by goats, but refused by cows, sheep, horses, and swine.—Its rough stalks are employed by cabinet-makers and turners, for polishing wood, bones, brass, &c.

Marine Acid. See Spirit of Salt.

MARJORAM, or *Origanum*, L. a genus of perennial plants, comprising 14 species: of these, one only is indigenous, namely, the *vulgare*, Common, Wild, or Field Marjoram, which grows in thickets and hedges; it flowers in the months of July and August.

This plant delights in a calcareous soil, and is easily propagated either by its seed, or by slips of the roots. It is a fragrant aromatic, has a pungent, spicy taste, and is much esteemed for culinary purposes; especially for imparting a fine flavour to broths.—The dried leaves are uncommonly grateful, and are sometimes used as a substitute for tea.—An essential, but extremely acrid, oil is expressed from this herb, and which is often employed by farriers as a *caustic*.—If a little cotton wool, moistened with such oil, be introduced into the hollow of an aching tooth, it frequently tends to relieve the pain.—The whole plant, excepting the root, when boiled in water, imparts a bright red and deep brown colour to wool, especially if the latter be frequently taken out of the liquor, and properly beaten. But, if linen is to be dyed of a purple colour, it ought to be previously steeped in alum water, then immersed for 48 hours in a decoction made of the bark of the crab-tree.—In Germany, the dried herb is occasionally suspended in a cask of beer, with a view to correct its tart or acid taste.—Goats and sheep eat its leaves and stalks; but they are not relished by horses; and totally refused by cows.

MARKET, a public place in a city or town, where live cattle, provisions, or other commodities are exposed to sale.

In the country, each article sold in markets must be deposited in the usual place appointed for its sale; but, in London, every shop is a kind of open market.

By the 1 Jac. I. c. 21, all contracts for any article vendible in markets are obligatory; and sales *alter* or transfer the property, provided they be made in conformity to the following rules; viz. 1. The sale must be in an open place, appointed for the disposal of such goods, so that any person passing by may see it. 2. It must be *actual*, that is, for a valuable consideration. 3. The buyer is not obliged to know that the vendor has a wrong title to the commodities sold. 4. Such sale ought not to be fraudulent between two persons, with a view to deprive a third of his right or property. 5. There must be a sale and contract, by persons who are legally qualified to execute the same. 6. Such contract should be made in open market. 7. Toll ought to be paid, wherever it is made payable by any statute. 8. The sale ought to be made between sun-rise and sun-set; though, if it be in the night, it is equally binding on the parties. Lastly, if goods, stolen in London, be sold to brokers, &c. the property of the original proprietor remains unaltered.—Beside these rules, the wisdom of the legislature has provided various other regulations, admirably calculated to prevent fraud and imposition, but which our limits will not permit us to detail.—See also Fair.

MARLE, a kind of calcareous earth, which is often and advantageously employed as a manure. It is found in various parts of Britain, and generally lies at the bottom of low bogs.

Marle is divided into three species; calcareous, argillaceous, and siliceous or sandy; all of which are composed of chalk and clay, so as to crumble with greater or less facility, on being exposed to the atmosphere. They are of a soft, unctuous nature, and dissolve speedily after rain: when dry, they slacken in the same manner as lime, and are at length converted into a very fine powder. Their quality varies according to the soil under which they are deposited: the Norfolk marle is held in the greatest esteem; but the most valuable is that found near the sea, or large rivers.

1. *Calcareous Marle* is, in general, of a yellowish-white or yellowish-grey colour, but in some places of a brown or red cast. It is commonly discovered a few feet beneath the surface of the soil, and on the sides of hills, or on the banks of rivers flowing through calcareous countries. This species of marle is mostly of a loose texture; and, though sometimes moderately coherent, yet it seldom possesses a stony hardness, in which state it is called *stone-marle*. When it is so thin as to be called *paper-marle*, it is frequently mixed with shells; on which account it is called *shell-marle*, and is reputed to be the best sort. It effervesces with acids: when pulverized, it feels dry between the fingers; and, if im-

mersed in water, it readily crumbles to pieces; but does not form a viscid mass.

2. *Argillaceous marle* is of a grey, brown, or reddish-brown colour; being harder, and more unctuous, than the former species, and adhering to the tongue. It effervesces with aqua fortis, or spirit of salt, but not with vinegar: in water, it dissolves more slowly; and, if it be exposed either to air or moisture, it does not moulder so quickly as the calcareous kind.

3. *Siliceous* or sandy *Marle*, contains a greater proportion of sand, than of chalk or clay. This species is of a brownish-grey or lead colour; it is, in general, friable and *flaky*, but sometimes forms very hard lumps. It effervesces with acids, but neither dissolves in water, nor moulders so speedily as either of the two former kinds.—Marle affords an excellent manure for sandy, dry, gravelly, or light lands of any kind; it likewise produces very beneficial effects on mossy and clayey soils; provided a due proportion be applied, and afterwards perfectly dissolved.

The quantity necessary to be used, varies according to the nature of the soil; but the utmost caution is requisite; because, if too large a portion be scattered on the land, it cannot be easily removed; and, if too little be employed, the deficiency may be readily supplied. On sandy, gravelly, or light soils, it will be advisable to spread as much as will form a thick coat, in order to bind and stiffen the ground. But, of whatever nature the land may be, the most judicious cultivators recommend such a portion to be laid on it, as will form a thin coat over the whole surface.

The proper season for *marling*, is the summer; as this kind of manure is then perfectly dry, and not only lighter, but also more easily reducible to powder. Marle, however, may be advantageously spread during the winter-frosts; as, in the latter season, there are few opportunities of performing other labours of the field.

Previously to marling, the land ought to be diligently cleared from all weeds, and rendered level, both with the brake and the common harrow, so that the marle may be equally spread on the surface; where it should be suffered to lie during the winter. In the month of February, and in dry weather, it will be proper to draw a bush-harrow, well weighted, over the land, that the marle may be uniformly distributed; but, as this manure is very ponderous, and sinks to the bottom of the furrow, if injudiciously ploughed in, it has been suggested to turn it into an *ebb-furrow* for the first crop: during the growth of the latter, the marle will incorporate with, and become a part of the soil, from which it does not readily separate. So permanent, indeed, are its fertilizing properties, that, if land be properly marled, it will continue arable for the space of 12 or 14 years; and, for pasture, during a much longer period.

As marle affords so valuable a manure, it will be useful to point out a few characteristics, by which it may be distinguished from different substances that resemble it. For this purpose, a small mass or lump should be exposed to the air: if genuine, it will, in a short time, by the action of the dews, nitre, &c. crumble into small pieces; and there will likewise appear a hoary or whitish congelation on the side accessible to the rays of the sun.—Another method consists in reducing the marle, when dry, to small particles, which are to be thrown into a coal-fire; where, if it be native or pure, it will crackle in a manner similar to salt. But the most certain criterion is, to break a small piece of dry marle into a glass of pure water; in which, if the substance be of the genuine kind, it will speedily dissolve; forming a soft, almost impalpable paste, and throwing up many bubbles or sparkles to the surface of the water. The experiment may be repeated with vinegar, in which fluid the effervescence will be considerably stronger: in both cases, however, it will be necessary to keep the glass steady; as otherwise, if it be agitated, the intestine motion cannot be distinctly observed.

A good *artificial marle* may be prepared, by mixing equal quantities of pure clay and lime, in alternate layers, so as to form a heap, which should be exposed to the winter frost: this compound is well calculated for light lands; but, if the soil be strong and heavy, it will be necessary to substitute loam and sand for the clay.—Such compositions may be usefully employed, where marle is not easily procured; as they will amply repay the labour bestowed on mixing them, being little inferior to the genuine calcareous earth.

MARL-GRASS. See CLOVER, the Common.

MARRIAGE, a contract both civil and religious between a man and a woman, by which they engage to live together in mutual friendship, and love, during the remainder of their days.

Matrimony has been instituted among all enlightened nations, for the wisest of purposes; and, as the contract continues in force for life, such partner ought to be chosen with the utmost circumspection.—If this circumstance were always duly weighed, there would certainly be fewer of those unnatural marriages, in which blooming youth is united to the aged or decrepid.

One of the most important points that merits constant attention, is the *healthiness* of the parties.—Those who are the obvious victims of hereditary disease, ought, in conformity to every principle of justice and of reason, to be suspended from the connubial rites. Similar limitations should be observed with respect to the union of deformed persons, especially females, for whom a state of celibacy is doubtless more eligible; unless it appear from proper inquiry, that, notwithstanding their external deformity, they are fully competent to discharge the dignified maternal duties. Farther, an equality in point of natural disposition, temporal fortune, and of age, in both parties, should, as far as possible, regulate the choice.—In the latter respect, the most proper period in general appears to be (in temperate climates) between the age of 18 and 20 in the female, and from 22 to 24 in the male sex.

Marriage is considered by the English law wholly as a *civil contract*, the sanctity of the matrimonial state being left to the Ecclesiastical Court, which is empowered to punish or annul incestuous or other unscriptural marriages. It admits all as good and valid, provided the parties, at the time of concluding the contract, were not legally disqualified from performing the same, and have executed it in due form of law.

The disabilities of contracting marriage are of two kinds, viz. 1. Canonical, that is, those which are void or voidable in the Ecclesiastical Law, such as *consanguinity*, or relation by blood, and *affinity*, or relation by marriage; together with some bodily infirmities. 2. Legal, that is, such as are created or enforced by the municipal laws; for instance, a prior marriage; lunacy; want of consent either of parents or guardians; and minority. Thus, in the last mentioned case, if a boy under 14, or a girl under 12 years of age, marry, they may, on attaining the age of consent, declare the marriage void, without any divorce in the Ecclesiastical Court.

There are various other regulations, made by different statutes, with a view to secure the happiness of subjects in this most important state, but our limits will not permit us to detail them. Hence we shall only observe, that several acts impose a penalty of 100l. on every clergyman who marries a couple, either without publication of the banns, or without a license. And, if any woman, under the age of 16 years, be married without her parents' or guardians' consent, the clergyman performing the ceremony is, by the 4th and 5th of PHIL. and MARY, c. 8, liable to a fine, or five years imprisonment; and the woman's estate is to be enjoyed during her husband's life, by the next heir.—Farther, no marriage is valid, unless solemnized in a church, or other place where banns are usually published; except if a special license be obtained for the purpose.

By the 26th GEO. II. c. 33, every person knowingly offending and acting to the contrary, is guilty of felony, and liable to be transported for fourteen years; provided the prosecution be commenced within three years after such illegal solemnization of marriage.

MARRAM. See Sea-MATWEED.

MARROW, in animal economy, an oily matter secreted by the arteries of the internal membrane, which covers the bones. Its particular use, to the living body, has not hitherto been clearly ascertained; though it is probably of the same service to the bones, as fat is to the soft parts; namely, to render their fibres less brittle, by its lubricating property.

With regard to its medicinal effects, marrow is doubtless more subtle and penetrating than any other animal fat; and ought therefore to be eaten with great caution. As it is much relished by epicures, it will be proper to observe, that marrow is with difficulty digested, unless thinly spread on toasted bread, with the addition of salt, and used with moderation.—We believe, however, that it might with more advantage and propriety be employed for liniments and ointments prepared for immediate application; because it will, in this respect, be found superior to hog's-lard, though it more speedily turns rancid.

MARSH, signifies a tract of ground partly covered with water, yet so as to permit grass or other vegetables to rise above its surface: these, while gradually decaying, occasion putrid exhalations, which are extremely pernicious to the health of mankind.

Marsh-lands are chiefly employed for the grazing of cattle, which, in such pastures, fatten speedily: nay, it is by some writers, though we believe, erroneously asserted, that sheep feeding on them, are preserved from the rot. Without attempting to decide this question, we shall observe that it will be advisable to raise a bank, and plant it with trees, if possible, in the midst of the marsh, either crosswise, or in a semi-circle: they would afford a shelter for the cattle, and in a few years repay the expence of forming the plantation. If the soil be situated near the sea, it will also be requisite to form ponds or reservoirs for the reception of the rain, in order that the sheep, &c. may at all times be furnished with sweet water. Such fence or trees will, at the same time, serve to intercept the sea-breezes, which often *nip* the tops of the grass, if unsheltered from their influence.

In order to convert a marsh into firm or arable land, it should first be drained, in the manner described in p. 162 and foll. of our 2d vol. Its various parts ought next to be wholly changed: 1. By frequent ploughing, harrowing, and burning; 2. By the addition of marle, clay, gravel, or other heavy substances; 3. By such matters as act chemically upon the soil, and bring its latent principles into action; for instance, lime, chalk, alkaline salts, &c.; 4. By spreading those manures which have a large proportion of fat, or mucilage; such as putrid fish, sea-weed, stable-dung, &c.; because marsh-lands rarely contain any animal substances, which are, in a great measure, the chief constituent parts of a rich soil. —Lastly, by compression, either by the treading of cattle, or by the use of rolling-carts, and similar heavy implements.

In the Transactions of the "American Philosophical Society," we meet with an ingenious inquiry into the causes of the insalubrity of flat and marshy situations; together with directions for obviating or correcting their effects, by Mr. WILLIAM CURRIE. His plan aims at introducing and increasing the proportion of *oxygen gas* in the super-incumbent atmosphere, and preventing its future obstruction, by cutting off or diminishing the sources of putrefaction. He proposes to effect this object, by carrying off the stagnant waters through drains, or trenches; and, where the soil will not admit of these, by the aid of wells. With the same intention, all dead weeds, grass, and wood, are to be burned; all flats, sinks, or hollows, filled up with sand, clay, or lime; and these should be adorned with vigorous plants and grasses, particularly such as flourish late in the season; because vegetables, continually exposed to the rays of light, decompose the water imbibed from the earth, and thus replenish the atmosphere with oxygen, or pure vital air.

Where marshy situations are too extensive to render them completely dry, they ought to be constantly flooded, by means of dams and sluices, to prevent the effects of putrefaction. — Lastly, to obviate still farther the pernicious consequences of residing near marshes or mill-ponds, it will be useful to plant between those waters and the dwelling-house, rows of such trees as vegetate rapidly, and retain their verdure to a late period of the year, so that the humid vapours may be intercepted, while such vegetables furnish a constant supply of oxygen to the atmosphere.

Marsh-Cleaver. See Trefoil Buckbean.

MARSH-LOCKS, the Purple, or Marsh Cinquefoil, *Comarum palustre*, L. an indigenous perennial plant, growing in muddy and putrid marshes; flowering in the months of June or July; and producing red berries in autumn.—The whole plant may be usefully employed in tanning calf-skins.—The Irish, who dispose of milk in the streets, rub the inside of their pails with this herb; in consequence of which the milk appears to be thicker and richer.—The roots of the marsh-locks produce in dyeing an indifferent red colour.—Goats eat the plant, but it is not relished by either cows or sheep, and totally refused by horses and hogs.

MARSH-MALLOW, or *Althaea officinalis*, L. an indigenous perennial plant, growing in salt-marshes and on the banks of rivers; flowering in the month of August.

This useful plant may be easily propagated, either by parting the roots in autumn, when the stalks decay; or by sowing the seeds in the spring. It delights in a moist soil, where it will grow to a considerable size; and thrives well, when transplanted, in any soil or situation.—Bees are remarkably fond of its melliferous flowers.

Every part of the Marsh-mallow, and especially the root, on boiling it, yields a copious mucilage; on account of which, it is frequently employed in emollient cataplasms, and by way of infusion. In humid asthma, hoarseness, dysenteries, and likewise in nephritic and calculous complaints, it is of eminent service; as, by lubricating and relaxing the vessels, it procures a more easy passage to the stagnant fluids. It is with equal advantage applied externally, for softening and maturating hard tumors; and, when chewed, it is said to afford relief in difficult teething.—The *Syrup of Marsh-mallows*, sold in the shops, is prepared from the roots, and chiefly used for sweetening emollient decoctions.

MARSH-MARIGOLD, or Meadow-bouts; *Caltha palustris*, L. an indigenous perennial plant, thriving in moist meadows, and on the banks of rivers: it flowers in the months of April and May.

This hardy vegetable preserves its verdure during the winter: hence, its cultivation has been recommended by Du Hamel, as an excellent winter pasture for cattle.—It may be easily propagated either by parting the roots in autumn, or by sowing its seeds about the latter end of the summer: it requires a humid soil, and a shady situation. When gathered before they expand, the flowers, if preserved in vinegar with the addition of salt, may be used as a substitute for capers. The juice of the petals, boiled with a little alum, communicates to paper a yellow colour; and it may likewise be employed in the spring, for imparting a similar tinge to butter.—Although Boerhaave informs us that cows will not touch this plant, unless impelled by hunger, when it produces a fatal inflammation; yet we believe with Du Hamel and Bechstein, that cattle may eat it with safety; as they instinctively devour its bitter leaves.—Goats and sheep also relish the Marsh-marigold; but horses and swine refuse it.

Marsh-Trefoil. See Trefoil Buckbean.

MARTIN, or *Hirundo urbica*, L. a well known bird of passage, which makes its annual appearance in Britain, from the beginning of April to the middle of May, according to the state of the weather.—See SWALLOW.

MARTIN, the COMMON, or *Mustela foina*, L. an animal of prey, which inhabits Britain, Germany, France, and the South of Europe. It is a most elegant and lively quadruped, its motions being exceedingly nimble. The female breeds in hollow trees, and produces, while young, three or four; but, when several years old, frequently six or seven martins at a litter; which, in winter, have sometimes been found deposited in the nests of magpies.

These animals are very destructive to poultry, eggs, &c. in farm-yards. With a view to obtain access to pigeon-houses, or hen-roosts, they climb rough walls with facility... As they are remarkably fond of honey and hemp-seed, they might be thus easily entrapped:—their skin and excrements emit a musky odour.

Martins are tamed with great difficulty, never forming any attachment, so that they must always be chained. Nevertheless, if properly secured, they are very useful in farm-yards, for destroying rats, mice, &c.

We are not acquainted with a better method of exterminating these depredators, than by smothering them in their recesses with the smoke of sulphur.

The skins of the Russian martins, furnish a beautiful fur: when imported, they pay a duty of 3l. and 6d. per *timber* of 40 skins: the sum of 12s. 1½d. is also payable for every 120 tails passing through the custom-house, in a raw or undressed state.

MARYGOLD, the TRIFID BUR, TRIFID DOUBLE-TOOTH, WATER-HEMP, or HEMP-AGRIMONY; *Bidens tripartita*, L. an indigenous annual plant, growing in marshy and watery places, and flowering in the months of August and September.—DAMBOURNEY and other writers inform us, that both the fresh and dried herb imparts to wool, with the addition of alum, a very bright yellow colour: the yarn or cloth, however, should be washed and dried before it is immersed in the dyeing liquor, in which it ought to be boiled for two hours; and, in order to extract more effectually the colouring particles, the plant must be cut in small pieces, put in the vessel, in alternate layers with the substances to be tinged, and properly agitated.

There is another species, namely, the *Bidens cernua*, or NODDING MARYGOLD, which is possessed of similar properties.

MARYGOLD the CORN. See Great White OX-EYE.

MASH, a drink given to horses.—It is prepared by infusing half a peck of ground malt in a sufficient quantity of boiling water, then agitating the liquor, till it acquires a sweet taste, and when lukewarm, administering it to the animal.

This preparation is used generally after a purge, in order to promote its operation; and, after hard work; or, as a substitute for drink, when a horse labours under depressing sickness.

MASTERWORT, the COMMON, or *Imperatoria Ostruthium*, L. is an indigenous, perennial plant growing in damp meadows, and flowering in the month of June. It is cultivated in gardens, on account of its medicinal properties, and may be propagated either by sowing its seed, or by parting the roots in autumn.

Masterwort produces a warm and aromatic root, which has been recommended in the dropsy; as well as in debility of the stomach and bowels. An infusion of it in wine is said to have cured quartan agues, after the bark had failed.—When chewed, it produces a copious flow of saliva, excites a heating but agreeable sensation in the gums; and frequently affords relief in the rheumatic tooth-ach.—HOFFMAN asserts, that the roots of this vegetable are of great efficacy in flatulencies, and the painful colics thence arising: when dried and pulverized, they have sometimes afforded relief in asthmatic cases, and disorders of the head.—Boiled in a recent state with lard, they form an ointment, that is reputed to be of considerable efficacy in removing ring-worms.—According to BAUTSCH, it has also been advantageously employed in tanning.

MASTIC, or MASTICH, the SYRIAN HERB, or MARUM GERMANDER, *Teucrium Marum*, L. a native of warm climates, and which we have incidentally mentioned, p. 369 of our second volume. Its leaves, distilled with water, yield a very acrid and penetrating essential oil, which resembles that obtained from scurvy-grass. And, though the plant is at present chiefly employed as a cephalic, there is reason to believe that it possesses very powerful diuretic and antiscorbutic virtues. Hence, Dr. GLEDITSCH strongly recommends an infusion of the leaves in wine properly digested, or a tincture prepared in proof-spirit, in diseases arising from relaxation of the solids, or a redundancy of viscid humours, such as lethargy, humid asthma, obstructions of the intestines, green sickness, swelling of the limbs, and the true scurvy. Being, however, an active medicine, the doses ought at first to be small, and but gradually increased; for instance, from one to three table-spoonfuls of the vinous infusion; or an equal number of tea-spoonfuls of the spirituous tincture should be taken, three or four times in a day.

MASTICATION, the act of chewing or grinding the solid parts of food between the teeth, by the united motion of the jaws, tongue, and lips; in consequence of which it is broken into small pieces, mixed with the saliva, and thus adapted for deglutition, as well as a more easy digestion.

This process in the animal economy is so essential to the prosperity of the individual, that those who are unfortunately deprived of their teeth, seldom enjoy a good state of health. Being unable to masticate *solid* food, they have recourse to rich soups, broths, jellies, &c. all of which require not only vigorous organs of digestion, but likewise a proper share of exercise: both conditions rarely concur in favour of the aged or decrepid, so that their fluids become gradually tainted with an unnatural acrimony; a disposition to a full habit or plethora is often induced; or the constitution is otherwise impaired.—Hence also the absurdity of suffering nurses (who are perhaps the masked victims of disease) to chew the victuals of healthy and uncontaminated infants.—It is equally pernicious to swallow solid food at meals, in so expeditious a manner as to allow no time for proper mastication.

tication. Many persons thus ignorantly lay the foundation of a foul and disordered stomach; the conquences of which are, frequent eructations, flatulency, colic, &c. Every particle of animal or vegetable aliment which is eaten in an unmasticated state, requires at least *double* efforts of the digestive organs, and is not productive of *half* the nutriment which it would otherwise afford. Daily experience amply corroborates this assertion, especially in the articles of *boiled* animal food, carrots, cucumbers, &c. if hastily consumed.—Lastly, there is a degree of brutality in *fast eating*, which is highly reprehensible; besides, the injury thus occasioned to the individual cannot be easily repaired.

MASTICH, a resinous substance exuding from the mastich-tree, or *Pistacia lentiscus*, L. a native of the southern parts of Europe. The best is imported from Chios, in the Levant, in small transparent grains, of a yellowish colour, and an agreeable smell, when heated over the fire.

This resin is recommended in obstinate coughs; dysenteries; weakness of the stomach; and in all cases of debility and laxity of the fibres. For such purposes, it is dissolved in rectified spirit of wine, and may be taken in doses of thirty or forty drops diluted with water, every three hours, or oftener.

MASTICOT, or YELLOW LEAD, is the calx or ashes of lead, obtained by slow calcination, in consequence of which that metal acquires a lighter or deeper yellow colour, according to the degree of heat. — It is sometimes used by painters; but is also employed medicinally, as a drying powder, in the composition of ointments or plasters.—See LEAD.

MASTIFF, *Canis villaticus, v. catenarius*, L. a valuable species of the dog-kind.

This bold animal is alike remarkable for his loud voice in barking, his extraordinary size, and surprizing strength. So great indeed is their courage and muscular power, that three of these quadrupeds are more than adequate to cope with a lion.

The mastiff is particularly valuable as a vigilant house-dog, and it is much to be regretted, that this species of useful creatures has, within a few years, rapidly declined in numbers.—For the most proper method of managing dogs, in general, the reader is referred to that article.

MATCHING, a method of preparing vessels for the preservation of wines, cyder, or similar liquors, from becoming sour. It is effected in the following manner: Let any quantity of sulphur be melted in an iron ladle; and, as soon as it is liquefied, slips of coarse linen cloth are to be dipped in it; which, when taken out and cooled, are called *matches*. One of these slips is now to be lighted, and suspended in the bung-hole of a cask, which ought to be slightly stopped, till the *match* is consumed; when the hole may be closed, and the vessel be suffered to stand for one or two hours. On opening the bung-hole, it will be found that the sulphur has communicated to the whole cask a very pungent, though suffocating and acid, odour.

The vessel may next be filled with small wine, newly fermented; and, on carefully closing it, the liquor will speedily clarify. This method is very commonly practised in different parts of England, and is said to be very useful; as many poor wines may thus be preserved potable for a considerable time. We doubt, however, its salubrity; and conceive that other articles might be advantageously employed instead of the pernicious fumes of sulphur, which render both wine and cyder alike unwholesome, especially for persons affected with diseases of the breast or lungs.

Matgrass. See Matweed.

Mathen. See Fetid Chamomile.

MATLOCK WATERS, are those mineral springs which issue from the limestone-hill or rock, on which the village of Matlock, in Derbyshire, is situated. They are remarkable for their purity; and are both cold and tepid: the latter flow abundantly, and are partly collected into baths for medicinal purposes.

The sensible qualities of the Matlock waters vary but little from those of good spring water, which they greatly resemble in taste; being perfectly clear; divested of all acidulous flavour: and exhaling no steam, unless during very cold or frosty weather.

These springs may be advantageously used in all cases, where pure diluent drink is necessary; but they are chiefly resorted to for tepid bathing; and form a medium between the waters of Buxton or Bath, and those of the sea, for which last they may be beneficially substituted by invalids. Their temperature exceeds that of the cold bath only in a few degrees; and, as the Matlock waters produce a very slight shock, on immersion, they are particularly calculated for those persons whose delicate or weakly frames are unable to support the sudden effects of the usual cold bath.

Matrimony. See Marriage.

MATWEED, the Sea, Helme, Sea-reed, or Marram, *Arundo arenaria*, L. an indigenous perennial plant, growing only on the driest sandy shores, and flowering in the month of June or July. This useful reed prevents the wind from dispersing the sand over the contiguous fields, which, by neglecting its propagation by seed, are not unfrequently rendered useless. The Dutch have availed themselves of this advantage; and, for the same reason, Queen Elizabeth wisely prohibited the extirpation of this beneficial vegetable. It is at present cultivated on the Norfolk coast, with a view to prevent the irruption of the sea: the inhabitants of Newborough, in the Isle of Anglesea, manufacture it into mats and ropes, whence they obtain their chief support.—In Denmark, the fibrous roots of the Sea Matweed are employed for making whisk-brushes; and the Icelanders collect and dry the seeds; from which, after reducing them to powder, a palatable bread is prepared, resembling in taste the meal of malt.

MATWEED, the Small, Heath-matweed, or Mat-grass, *Nardus stricta*, L. an indigenous perennial plant, growing on moist heaths and marshes; flowering from June to August.—It is eaten by horses and goats, but disliked by cows and sheep.

This species is often a troublesome weed, as well on arable lands as on pastures, where it affords but coarse food to cattle: as it, however, forms large and thick tufts, which resist the action of the scythe, it may be usefully transplanted to loose sandy lands: in such situations, its spreading horizontal roots greatly tend to consolidate the soil, and increase the stratum of vegetable mould, for the reception of more useful plants.—Bechstein remarks, that it would be advisable to propagate the Small Matweed in young plantations exposed to cold and bleak winds; on account of the protection it might afford to tender trees.

Mauls. See Mallow.

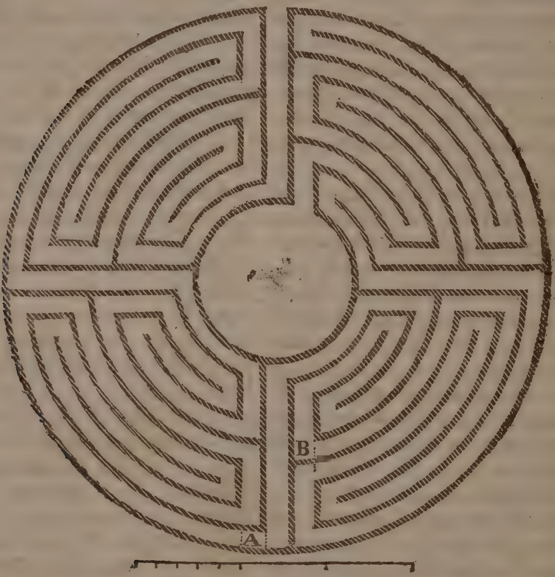
May. See Hawthorn.

May-lily. See Lily-of-the-valley.

Mayweed. See Fetid Chamomile.

MAZE, or Labyrinth, in Gardening, denotes a piece of ground, planted and arranged in various meanders, so as to render it difficult, after entering the walks, to find the leading avenue.

Labyrinths contribute equally to health and amusement; and, as few persons possess gardens or pleasure-grounds sufficiently extensive for long walks, we have subjoined an outline of a maze, in which simplicity and economy are strictly combined.



The principal expence of such a maze, will be the green hedges, which ought to be seven feet high; and, if the breadth of the walks be calculated at four feet, beside 12 inches for the room occupied by the shrubs, the diameter of the whole will not exceed 150 feet. In the centre might be planted a lofty chesnut or other tree, with spreading branches; or a circle of poplar-trees, the height and sprightliness of which invite the wanderer to refresh himself under their cooling shade.

It should be remarked, that the

plan, as appears from the preceding cut, represents only regular intertwined walks which, by various circumvolutions, lead exactly to the central spot of ground. But, if it be designed to establish a real *labyrinth,* on a larger scale, the hedges ought in various directions to be interrupted; for instance, at the points marked with the letters A, and B, in order that those who mistake the true path, might inadvertently return to the avenue whence they came.

Lastly, a maze should, if possible, be so situated, that it may be viewed from the windows of a house, or an elevated spot, in its vicinity. Thus, it will afford an interesting spectacle to persons of the most opposite disposition of mind: the gay and cheerful will delight in beholding others perplexed in the pursuit of the central spot; while the grave and reflecting have an opportunity of viewing, as in a mirror, a picture of active life, where man often seems to deviate from the true path, which nevertheless conducts him the nearest way to the end of his journey: while others, though sometimes very nigh the desired object, in a manner blindfold pass by, and with every step advance on the contrary road!

Mazzards. See Common Wild Cherry-tree.

MEAD, an agreeable liquor prepared of honey and water, with the addition of spices.

Various methods are practised in the brewing of mead; which, however, do not essentially differ from each other: the following is one of the most approved:—Let the whites of six eggs be well incorporated with twelve gallons of water, to which twenty pounds of honey are to be added. The ingredients should boil for the space of one hour; when a little ginger, cloves, cinnamon, and mace, together with a small sprig of rosemary, are to be put into the liquor. As soon as it is cool, a spoonful of yeast ought to be added, and the mead poured into a vessel which should be filled up, while it *works*. When the fermentation ceases, the cask ought to be closed, and deposited for the space of six or eight months in a vault, or cellar, of an equal temperature, and in which the liquor is not liable to be affected by the changes of the weather. At the end of that period, it may be bottled, and is then fit for use.

A more simple, and, to some palates, more agreeable method is, to mix the honey in the proportion of one pound to a quart of water, which is to be boiled, scummed, and fermented in the usual manner, without the addition of any aromatic substances. It ought to be preserved in a similar manner, and bottled at the expiration of the same period of time.

Mead was formerly the favourite liquor of the ancient Britons, and Anglo-Saxons. It still retains its place at country feasts in the western parts of this island; where considerable quantities are brewed annually. Being an wholesome and pleasant beverage, it is far preferable to brandy, gin, or other pernicious spirits; though it does not always agree with the bilious, asthmatic, or those whose breast and lungs are in the least affected. But, if it be kept for a number of years in proper vessels, and dry cellars, it acquires a flavour and strength equal to the best Madeira or even Tokay wines: in this state, mead is a true medicine to the aged and infirm, when used with moderation.

MEADOW, generally signifies pasture, or grass land, that is annually mown for hay; but it more particularly denotes such tracts of ground as are too low, and too moist for cattle to graze on them during the winter, without injuring the sward.

The best lands for meadow are those situated on a gentle declivity, so as to be irrigated at pleasure, and which at the same time possess a rich soil and moist bottom, especially if it be in the vicinity of a brook, or small running stream.—See IRRIGATION.

Great Britain and Ireland are reputed to possess the most verdant pastures, and the finest natural grasses, in the vegetable creation: these advantages, however, do not appear to meet with that attention which they deserve. Lately, indeed, the cultivation of grasses has been a favourite pursuit among experimental farmers and freeholders; but, as the tenantry, in general, are bound to follow a certain rotation of crops, without having the power of breaking up old and unproductive meadows, *extensive* improvements cannot be expected, while such limitations prevail.—We have cursorily mentioned these obstacles to national prosperity; because they would require a more ample investigation than is compatible with our limits.

The first requisite towards obtaining a good meadow is, a perfect acquaintance with the best natural grasses, their peculiar soils, and the best mode of collecting their seeds: the most valuable are those of the northern and eastern parts of England. But, as comparatively few have an opportunity of procuring such seeds, the only method that can be pursued with hopes of success, appears to be that of selecting those grasses, which thrive luxuriantly on a similar soil; and to gather the ripe seed from a productive old meadow.

On lands intended for pasture, and especially for sheep, it is advisable to sow *three* kinds of vegetables, with a view to gain the advantage of successive growth. Thus, Mr. PARKINSON sows four bushels of the seed of ray-grass, or red darnel *(Lolium perenne, L.)*; 10lbs. of trefoil seed (more properly common clover, *Trifolium pratense*, L.); and a similar quantity of white clover *(T. repens, L.)* He is of opinion that the ray-grass should be grazed early, while the white clover is still concealed in the ground, and the trefoil, or common clover, is just appearing; that, when the darnel is eaten down, the common clover will spring up, and afford excellent food for sheep; after which the white clover will appear: and, when the latter is consumed, the ray-grass again grows, and supplies pasturage during the winter months, if the weather prove tolerably mild. Hence this truly "experienced farmer" maintains, that one-third more in number of sheep, at least, may be thus supported than by any other method.

In order to form a meadow, far superior to the generality of artificial pastures, Mr. CURTIS recommends six kinds of grass, and two of clover, to be sown broad-cast. The seeds are to be mixed together in the following proportions, viz.

Meadow Fescue-grass :	*Festuca pratensis*, - -	4 parts
Meadow Fox-tail-grass :	*Alopecurus pratensis*, -	4

Smooth Stalked Meadow-grass :	*Poa pratensis,*	-	2 parts
Roughish Meadow-grass :	*Poa trivialis,*	-	2
Crested Dog's-tail-grass :	*Cynosurus Cristatus,*	-	1
Sweet-scented Spring-grass :	*Anthoxanthum odoratum,*		1
White or Dutch Clover :	*Trifolium repens,*	-	2
Common or Red Clover :	*Trifolium pratense,*	-	2

These are to be mixed together, and about three bushels of them sown on an acre, in rows, so that they may be more conveniently hoed; in consequence of which they will vegetate with greater luxuriance. Towards the end of August, or early in September, it will be necessary to weed and *thin* the grasses occasionally, and also to roll them in the spring; an operation by which such roots as may have been raised by the frost, will be pressed into the ground. Mr. Curtis is farther of opinion, that the meadow fox-tail, and roughish meadow-grasses, are best adapted to moist soils; the smooth-stalked meadow and crested dog's-tail, to dry pastures; and lastly, that the meadow-fescue and sweet-scented spring-grasses will suit land, which is either moist or moderately dry.

If the soil be previously cleared from all noxious weeds and plants, the above-specified combination of grasses will, in the course of two years, form a most excellent meadow. But, in case it be required to *seed* a piece of land immediately, and the valuable grasses before mentioned cannot be procured, it has been recommended ("*New Farmer's Calendar*," p. 440, 2d edit. 8vo. Symonds, &c. 1801) to sow the following seeds, which are easily attainable; viz. Broad clover (a variety of the common clover), or cow-grass; white clover, trefoil, ray-grass, and, if the soil be sufficiently dry, burnet. On clean tilth, they will, in a few years, present a good meadow; as the clover and ray-grass, in the first or second year, produce an ample swathe for mowing; next, they will be succeeded by a luxuriant crop of the white clover and trefoil, united with the natural grasses of the soil.

Grass-seeds ought to be sown during moist weather, either in the summer or in autumn, after turnips, cabbages, or any other hoeing crop; for it is absolutely necessary to prepare for them a fine and clean tilth. On the approach of winter, the young crop should be slightly covered with long stable-dung, old thatch, or even sand, earth, or any other manure. The land ought, likewise, to be occasionally cleared of the weeds, together with their roots, and the vacant spots fresh *seeded.*

In laying lands down for meadows, old turf must be uniformly broken up, by paring and burning, when it is to be sown with new grasses; but, such soils as have been completely exhausted by successive crops of corn, should first be laid dry and diligently cleaned; then sown with proper herbage, *top-dressed*, and manured for the space of two or three years; in consequence of which they will recover their former fertility.

Lastly, the operation of rolling meadows in the spring, especially such as have been irrigated, ought never to be omitted. The most proper time for this purpose is the beginning or middle of February, after the land has been laid dry for a week. Rolling prepares the grass for being cut close to the surface, when mown; which is a circumstance of considerable importance; because the ant-hills, and other little elevations, are thus pressed closely to the ground, and many inconveniencies will be thereby effectually removed.

MEADOW-GRASS, or *Poa*, L. a genus of plants comprising 53 species, 16 of which are natives of Britain: the principal of these are:

1. The *aquatica*, or REED MEADOW-GRASS, growing in marshes and on the banks of rivers, flowering in the months of July and August.—This species is uncommonly valuable for being propagated on the banks of rivers or brooks, where it is devoured with great avidity by horses, cows, and sheep: but, as it is apt to *blow* or distend the bowels of cattle, when eaten too largely, or when its panicles are burnt, these circumstances deserve some attention. It abounds particularly in the Isle of Ely, rising to the height of six feet, though usually mown when about four feet high: after being dried, it is bound up in sheaves, then formed into *ricks*, in which it undergoes a slight degree of fermentation, to improve its sweetness for provender. In this state, it is provincially called *White-lead*, from its acquiring a white surface when dry: it is peculiarly useful for milch cows; but horses do not relish it, when thus prepared.—The reed meadow-grass is one of those vegetables that deserves to be more generally known and cultivated; as it likewise affords, if properly dried, an excellent substitute for straw, in thatching.

2. The *pratensis*, or SMOOTH-STALKED MEADOW-GRASS, which grows on dry banks, and even on walls: it flowers in the months of May and June. This plant thrives better in dry than in moist situations, whence it retains its verdure during hot and dry seasons, longer than any other vegetable. Its root spreads along the ground almost as rapidly as the couch-grass, and is nearly as difficult to eradicate: it ought, therefore, to be introduced with great caution, where the pasturage is not intended to be permanent.—Though eagerly eaten by cattle, and esteemed to be one of the best grasses for hay, its value decreases, as its quantity every year diminishes in dry soils; and it at length produces very indifferent crops. This diminution is occasioned by its roots *matting* together, and exhausting the land; which effects, however, may be prevented by manuring the soil, and are not so perceptible on moist grounds, where the plant will flourish, though not so luxuriantly as in dry situations.

3. The *annua*, ANNUAL MEADOW-GRASS, or Suffolk-grass, which grows on pastures, in paths, gravel-walks, and the borders of fields; it flowers during the whole summer.—This grass is devoured with avidity by every kind of cattle; and as it abounds in the county of Suffolk, where the finest salt-butter is prepared, Mr. STILLINGFLEET conceives it to be the best grass for milch-cows.

4. The *trivialis*, ROUGHISH MEADOW-GRASS; Bird-grass; Fowl-grass; or Fold-meadow-grass. It is perennial, grows in moors, moist pastures, and the sides of hedges; and flowers from June to September. This plant is reputed to be in every respect the

first of British grasses; as the best meadows abound with it, and particularly the celebrated *Orcheston Meadow*, in the county of Wilts. And though few grasses are more productive, or better calculated for hay or pasturage, than the rough meadow-grass, yet it requires a moist soil, and a situation somewhat sheltered, being liable to be injured by severe cold or excessive drought. It is much relished by every kind of cattle.

5. The *compressa*, FLAT-STALKED, or CREEPING MEADOW-GRASS: It is perennial; grows on walls, house-tops, and very dry situations, and flowers from June to August. —This species, in the opinion of Dr. ANDERSON, is the most valuable of the meadow-grasses. Its leaves are firm and succulent; of a dark Saxon-green colour; and grow so closely together, as to form a pile of the richest pasture-grass. Its flower-stalks continue to vegetate very luxuriantly during the summer; and, even in a fading state, the leaves retain their beautiful green cast. The latter are much larger, and more abundant than those of the roughish meadow-grass. Besides, it produces a fine turf in parks and sheep-walks, while it renders the flesh of deer and sheep, uncommonly tender and sweet flavoured; being a favourite food of these animals.

6. The *palustris*, or MARSH MEADOW-GRASS, which abounds in marshes and overflowed lands. It grows to the height of four or five feet; is excellently calculated for laying down spongy or fenny grounds; and is reputed to be equal, if not superior, to any other vegetable for the purposes of the dairy.—In autumn, however, its leaves become somewhat prickly.

7. The *maritima*, or SEA-MEADOW-GRASS, which is frequent on the sea coast, and flowers in the months of June and July.—It is one of the principal grasses which grow in salt marshes, and is eagerly eaten by cattle.

MEADOW-SAFFRON, or TUBEROOT, *Colchicum autumnale*, L. an indigenous perennial plant, being the principal of three species; growing in meadows; flowering in the months of August and September.

The flower of this hardy plant rises immediately from the root, and its large leaves appear in the succeeding spring: the former afford a beautiful variety of purple, white, red, rose-coloured, yellow, &c. with single and double flowers. —This vegetable is more ornamental than useful; and, though it frequently occupies a considerable part of a meadow, it is never touched by horses.

In its medicinal properties, the Meadow-Saffron resembles those of the Squill: the root of the former has ever been considered as an acrid poison, but it is less injurious in autumn than in the spring; its seed is also deleterious, though not mortal to either man or cattle.—The juice expressed from the leaves of this plant, when rubbed on the skin of animals, affords a very powerful and effectual remedy against vermin, with which they are often infested.

MEADOW-SWEET, the COMMON, or QUEEN-OF-THE-MEADOWS, *Spiræa ulmaria*, L. an indigenous perennial plant, growing in moist meadows and on the banks of rivers; flowering in the months of June and July. Its stalk attains the height of four feet; and the fragrant flowers, when infused in boiling water, impart to it a very agreeable odour, which rises on distillation: hence they are often employed by wine-merchants, for improving the flavour of *made* wines. The roots are so powerfully astringent, that calf-leather has been tanned with them in a fortnight. According to BRYANT, the Russians prepare of these roots a palatable granulated flour or *groats*; and OLAFFEN informs us, that the Icelanders dye a durable black colour, by a decoction of the whole plant.—Hogs devour the roots with avidity; goats and sheep also relish this herb, but cows and horses refuse it.

MEAL. See FLOUR.

MEALS. See DINNER.

MEALY-TREE. See GUELDER-ROSE.

MEASLES, or *Rubeola*, a contagious disease, accompanied with inflammatory fever, sneezing, defluxion of a thin humour from the eyes, and a dry hoarse cough.—On the fourth day, or sometimes later, small clustered pimples break out on the skin, but which generally disappear in three or four days, leaving behind branny or mealy scales.

The measles bear great resemblance to the small-pox; and likewise affect a person once only during his life. They are most frequent among children in the spring, but, if properly managed, seldom prove fatal.

The disease commences with a fit of shivering, succeeded by intense heat, thirst, anxiety, sickness, and vomiting, which vary in different constitutions. The eyelids are swelled; the eyes partially inflamed, and weeping; a constant drowsiness prevails; and, on the fourth day the pustules appear first on the face, and gradually spread over the whole body. The vomiting ceases, but the fever, cough, and difficulty of breathing, are increased. In the course of three or four days the pimples assume a pale colour, and by the ninth or tenth, are not to be perceived. But, the fever, and other symptoms will not abate so early, if the patient be not sufficiently cool: they are sometimes succeeded by an alarming and dangerous looseness, which may terminate in death, unless the strictest attention be paid to the whole state of the disorder.

Cure:—As the measles are of an inflammatory nature, it will, in some instances, be necessary first to bleed the patient, especially if the fever be violent; though that operation is, in general, neither necessary nor advisable.

In mild cases, it will be sufficient to keep the patient's body open, by means of tamarinds, manna, or other gentle laxatives; and to supply him frequently with barley-water, linseed-tea sweetened with honey, or other cooling and mucilaginous drinks. Considerable benefit will result from bathing the feet in warm water; and, if there be a disposition to vomit, it ought to be promoted by the liberal use of luke-warm water, or chamomile tea. The dry cough will be greatly relieved by gentle opiates, if used with due precaution, in preference to the oily or demulcent draughts given on such occasions.

The most fatal period of the measles, however, is at the *crisis*, or turn: should the fever then become violent, and the patient be in danger of suffocation, relief may be obtained by repeated venesection and blisters. If, nevertheless, the disorder appear to affect the interior organs, or *strike inward*, the imminent danger may sometimes be averted, by applying blisters both to the arms and legs, and briskly rubbing the whole body with warm flannels.

The patient's regimen, throughout this disorder, ought to be strictly *cooling*. His food should be light, and the drink may consist of barley-water, balm-tea, infusions of linseed, or other diluent liquids, sweetened with a little honey. When the malignity of the disorder is subdued, it will be advisable to administer a few gentle laxatives; and, if it be attended with a debilitating diarrhœa, this may be mitigated by taking a few grains of rhubarb every morning, and gentle opiates every night. The diet should uniformly be light, though nourishing; and the patient will also derive great benefit from frequent exercise in the country air.

MEASURE, in a legal and commercial sense, denotes a certain proportion or quantity of any commodity, whether dry or liquid, that is bought, sold, valued, &c.

Measures vary according to the different kinds and dimensions of the respective articles. Hence they are, in general, either longitudinal, which relate to lengths; or cubical, that is, solid measures, for bodies and their capacities. Of both we shall give a concise account; as our work would otherwise be incomplete.

I. Long Measure.

The smallest nominal part of the English long measure, is an *inch*, which is composed of three barley-corns, being the largest and finest that can be selected from the ear. Three inches form a palm; an equal number of palms make a span; $1\frac{1}{3}$ span, a foot; $1\frac{1}{3}$ foot, a cubit; 2 cubits a yard; $1\frac{2}{3}$ of a yard make a pace (consisting of *two* steps); $1\frac{4}{5}$ of a pace, a fathom; $2\frac{3}{4}$ fathoms form a pole; 40 poles, a furlong; and 8 furlongs are computed to a mile.

II. *Measure of capacity for dry articles.*

1. For Corn. The standard measure for salt, all kinds of grain, and other dry commodities, is the Winchester gallon, which contains eight pints, or $272\frac{1}{4}$ cubic inches:—2 gallons make a peck; 4 pecks a bushel; and 8 bushels a quarter. Four quarters of corn are computed to a chaldron; five quarters to a *wey*, or load; and ten quarters to a ton.

2. For Coal. In measuring sea-coal, five pecks make a bushel; 9 bushels, a quarter; 4 quarters, a chaldron; and 21 chaldrons are computed to a score.

III. *Liquid Measure.*

The English liquid measures were originally established on the basis of Troy-weight: it having been enacted by several statutes, that eight pounds troy of wheat (the grains of which have been selected from the middle of the ear, and well dried,) should weigh a gallon of *wine measure*; and that the divisions and subdivisions of the latter should form the decreasing smaller proportions. It was farther provided, that one liquid measure was to be uniformly adopted throughout the kingdom. Custom, however, has prevailed, and a new weight, namely, Avoirdupois (which see), was introduced; so that a second standard gallon has been adjusted to the old one, which it exceeds in the same proportion as the avoirdupois does the troy weight. From this standard, two different measures are regulated for *ale* and *beer*, which we have already stated under the articles FIRKIN, BARREL, HOGSHEAD, &c. The old standard measure (being kept under seal at the Guildhall, London) is employed for wine, spirits, &c. and contains the following subdivisions:—28$\frac{7}{8}$ solid inches form one pint (wine measure);—8 pints make a gallon;—18 gallons, a rundlet;—1$\frac{3}{4}$ rundlets, a barrel;—1$\frac{1}{3}$ barrels, a tierce;—1$\frac{1}{2}$ tierces, a hogshead;—1$\frac{1}{3}$ hogshead, a puncheon;—1$\frac{1}{2}$ puncheons, a butt, or pipe;—and 2 pipes, a tun.

These are the chief measures at present employed; a knowledge of which is very useful, and necessary, to prevent imposition. For this purpose, standard measures are kept in various parts of England, in conformity to which all others are directed to be made; so that, if any one be accidentally lost, it may be easily restored; or corrected, if it be inaccurate.

MEAT, a general appellation for the flesh of animals when prepared for food.—As we have already, under the article FLESH-MEAT, given the most effectual methods of preserving it in a fresh state during the summer months, and as we specify the simplest and best modes of pickling it under the heads of BEEF and PICKLE, we shall at present briefly state the treatment proper to be followed, in case any *putrid meat* has been accidentally eaten.

As soon as this unpleasant circumstance is apprehended, or discovered, it will be necessary in the first place to take a brisk emetic; the operation of which ought to be promoted by strong chamomile tea; that of itself is an excellent antiseptic. The patient should, next, drink liberally of the vegetable acids; and avoid eating or drinking any matter that may tend to press upon the organs of digestion, till the latter be restored to their natural tone and energy.

MEDICINE, is the art of preventing, curing, or alleviating those diseases, with which mankind are afflicted.

The history of medicine is lost in the remotest antiquity; and the researches of the most acute antiquaries, to ascertain the first inventor, have hitherto proved abortive. It would be foreign to our plan, to enter into a discussion of this subject; we shall therefore confine our attention to the *effects* of medicines on the human body, and refer the reader to the article PHYSICIAN, under which we propose to communicate a few hints, respecting the nature and practice of the healing art.

The operation of medicines on the human body has been attributed to various causes; several eminent physicians of the 17th and the 18th century ascribing their effects to mechanism. This opinion, however, has been strongly opposed, and, though the theory of *chemical decomposition* which now prevails among the medical philosophers of France and Germany, is more plausible, and in many instances strongly corroborated by facts, yet this, like all other conjectures tending to account for the hidden operations of Nature, does not deserve the name of a *theory*.

When judiciously administered, medicines are, doubtless, very beneficial; but, if they be given or *prescribed* at random (which is but too often the case with those regular and irregular practitioners who degrade an honourable profession to a *trade)*, they seldom fail to be productive of injury:—instead of affording relief, they aggravate the complaint, and not unfrequently lay the foundation of future disease.

Particular constitutions require a peculiar treatment; and, if more attention were paid to this important circumstance, there would be less occasion for employing *drugs*. Besides, it ought to be considered, that no substances but such as contain *alimentary* matter, are conducive to the welfare of the human body, in a *healthy* condition: hence, by analogous reasoning, no drugs whatever, if devoid of nutritious properties, can be perfectly harmless, in a *diseased* state.—See QUACKERY.

MEDICK, or *Medicago*, L. a genus of perennial plants, comprising twelve species; the principal of which are the following:

1. The *sativa*. See LUCERN.
2. The *falcata*, YELLOW MEDICK, or BUTTER-JAGS; growing wild in sandy pastures and cornfields; flowering in the month of July.

This bushy plant, if its stalks be properly supported, attains a height of four feet: it may be easily propagated by seed, in hot, dry, barren, and sandy situations, where it produces excellent hay. Its culture deserves to be strongly recommended; as it requires but an indifferent soil; withstands the severity of winters better than lucern; and is eaten eagerly by cattle, especially by horses, though its stalks are hard and woody.

3. The *lupulina*, TREFOIL MEDICK, or MELILOT TREFOIL; which grows in corn-fields, meadows and pastures; it flowers from the month of May till August.—This species is cultivated in the county of Norfolk, under the name of *Nonsuch*, and is usually sown together with ray-grass; whence, the crops are denominated black and white Nonsuch.—The trefoil medick thrives best in a loamy and swampy soil:—goats, cows, horses and sheep eat both species of this plant; though the latter is less grateful to these animals, than the former.

MEDLAR-TREE, the COMMON, or *Mespilus germanica*, L. a native of Britain, growing in hedges, and flowering in the month of May.

This hardy shrub is cultivated in gardens, either for the sake of its fruit, for standards, or as espaliers. It will thrive in any common soil, or situation, and may be propagated either by seeds, which lie two years under ground before they vegetate; or by grafting, or inoculating it on hawthorn or crab-tree stocks.—When designed for fruit-trees, they may be trained as dwarfs, for standards, or for espaliers: in either case, they are managed in a manner similar to apple or pear-trees.

Grafting, or budding, is the best and most certain method of cultivating the different sorts of the medlar, so as to continue their species: after pruning their first shoots from the graft, or bud, it will be necessary to force out a proper supply of wood for raising a head; then to train the branches chiefly at full length, and to suffer the standards spontaneously to expand.

Medlars possess a subacid, vinous flavour, which to many palates is very agreeable; though disliked by others: while firm and sound, they are of a remarkably austere and repugnant taste, which, however, is completely changed, when they begin in a manner to undergo the putrefactive fermentation, so as to become soft and mellow.—All the species of this fruit ripen about the latter end of October, or beginning of November; when they should be gathered; partly placed in moist bran, in several layers, to facilitate their maturation; partly deposited on straw, in the fruitery. After a fortnight, or three weeks, those kept in the bran will be eatable; and the others will gradually ripen.

In their medicinal effects, medlars are very astringent, and have therefore been used with advantage in diarrhœas: on the contrary, those who are of a costive habit, ought carefully to abstain from this enticing fruit.

According to GLEDITSCH and BAUTSCH, the leaves, branches, and unripe fruit of the medlar-tree, have been successfully employed in tanning.—The wood, being hard and tough, resembling that of the pear-tree, is useful for various domestic vessels, as well as for the smaller implements of husbandry.

MELANCHOLY, or partial insanity without any affection of the stomach, is one of those humiliating diseases which are peculiar to mankind.

Innumerable are the causes which may induce this most dreadful of human maladies; but there is one *material* circumstance, which, independently of the mental state, always occurs, and evidently operates in all melancholic patients; namely, an accumulation of impurities in the alimentary canal, consisting chiefly of *black bile*. Hence originate, want of appetite; a disturbed sleep; obstructions of the intestines; hemorrhoidal and gouty symptoms; irregular circulation of the blood; dulness and gloom of mind, without any apparent cause; at length, stupefaction and insensibility, terminating in madness.—Indeed, the melancholic and hypochondriac are so nearly allied, that it is not always easy to discriminate between the two diseases; a distinction which is the more important, as the proper method of curing the former would inevitably be attended with fatal effects to the latter: hence we shall point out the essential difference subsisting between them. In *hypochondriac* persons, the nerves are primarily affected, and contribute to generate all those spasmodic and other concomitant symptoms which disorder the organs of the lower belly: whereas, in the *melancholic*, there already exists in the same organs a material and local cause that produces similar effects, of which the nervous system of the hypochondriac partakes only so far as he is susceptible of such impressions, in the debilitated state of his mind.

Cure.—If the patient be young, robust, and of a full habit, blood-letting will first be necessary. Next, he ought to take resolvent emetics and purgatives, consisting of neutral salts, especially tartarized kali, in doses of from two to three drams every morning and evening, for several days.—Acidulated drinks, and a vegetable diet, will be of essential service, if combined with exercise and cheerful company. Among the most proper articles of the table are, ripe fruit in a fresh or dried state, honey, bulbous roots, salad, and well baked bread; but animal food should be carefully avoided. For common drink, the patient may use sweet whey, decoctions of barley acidulated with mead-vinegar, or currantrant-jelly; infusions of tamarinds or rennets, &c. On the contrary, tart wines and spirituous liquors or mixtures of every description, especially *punck*, always aggravate the complaint.—When habitual costiveness prevails, Grant recommends the following draughts, which are grateful and efficacious, without debilitating the stomach or bowels: Take one ounce of manna; half an ounce of tartarized kali; eight blanched sweet-almonds; and six ounces of rose-water; let the whole be duly incorporated in a mortar, and a tea-cupful be taken every hour, till it operates. After the desired effect is produced, a glass of good old wine, and nutritive mucilaginous food, may be safely allowed.

By a strict adherence to this regimen, there is reason to hope for a complete cure, in three months. If, however, the patient be intractable, and averse to adopt any regular plan (as is too frequently the case in this complaint), he should be prevailed upon to travel; to drink purgative mineral waters; to use the cold bath; to have his head shaved, for the purpose of applying a sponge or cloths dipped in cold water; and to receive gentle electric shocks, directed from a wooden point through the region of the lower belly. On the whole, experience has evinced, that *cold* bathing is most conducive to the recovery of hypochondriacs, while the *tepid* bath best agrees with maniacs.

Lastly, it is remarkable, that the *propensity to suicide* is, strictly speaking, a characteristic symptom of black melancholy; the principal seat of which appears to be in the nervous texture of the spleen, and the left arch of the colon. Many writers consider this dreadful complaint to be peculiar to the English; as it more rarely occurs among other nations of Europe. It is farther worthy of notice, that such gloomy disposition of mind, not unlike the true mania, generally manifests itself itself at certain changes in the atmosphere; for instance, when southern winds prevail, and the barometer sinks till near the mark which indicates *storm:*—then the fatal crisis either takes place in nine days, or the patient overcomes the attack, which terminates in calm, placid, melancholy, or a stupid insensibility.—On such occasions, profuse draughts of cold and pure spring water; a strong, well-fitted waistcoat; and a blister, applied to the region of the spleen, will be the most appropriate remedies. If the left side, under the short ribs, should be perceptibly warmer to the touch than the opposite side, the blister ought to be nine inches long and six inches broad, in order to cover exactly the *left hypochondriac region*, where the spleen is situated. Unexpected relief has often been thus obtained; and the cure has been promoted by light, though nutritive food, exercise, diversions, music, &c.

Melasses. See Molasses.

MELIC-GRASS, or *Melica*, L. a genus of perennial plants, comprising 14 species, of which the following are the principal:

1. The *nutans*, or Mountain Melic-grass, which abounds in the mountainous woods of the northern parts of Britain: it flowers in the months of June and July. This species is eaten by cows, horses, and goats;—in the Isle of Raasay, it is manufactured into twine for fishing-nets, which are remarkable for their durability.

2. The *cœrulea*, or PURPLE MELIC-GRASS, growing on boggy barren meadows and pastures, and flowering in the months of July and August. This valuable plant is eagerly eaten by horses, sheep, and goats: it also affords an excellent substitute for hair, in the manufacture of brooms, which furnish considerable employment for the country people, in the western counties of England.

3. The *ciliata*, or FRINGED MELIC-GRASS:

4. The *altissima*, or LOFTY MELIC-GRASS:—both are exotic, but valuable plants; as the former thrives on barren stony hills, where its stalk grows from two to three feet high, and is an excellent pasture-grass; while the latter is of a bushy nature, delights in almost every soil, and is much relished by cattle. Both species, therefore, deserve to be diligently cultivated in the northern parts of Britain, where large tracts of mountainous land produce scarcely any grass for sheep.

MELILOT, the COMMON, MELILOT-TREFOIL, KING'S-CLAVER, or HARTS-CLOVER, *Trifolium Melilotus officinalis*, L. an indigenous plant, growing on a stiff soil; on ditch banks; in thickets, hedges; corn-fields and meadows; flowering in the months of June and July.—This plant is eaten by sheep, goats, cows, hogs, and particularly by horses, which devour it with great avidity. Its fragrance increases when dry; and if its flowers be distilled, they yield a water, which, though possessing little odour in itself, imparts a very grateful flavour to other substances.

BECHSTEIN remarks, that the common melilot is frequently covered with *mildew*, which renders it extremely pernicious to cattle.—Thus, in Thuringia, a distemper prevailed lately among sheep, great numbers of which died of a putrid liver; because this and other species of clover were through the whole summer affected with the mildew: nay, even the hares were then uniformly in a state of putrefaction.

MELON, the COMMON, or MUSK-MELON, *Cucumis melo*, L. an exotic plant growing wild in Asia, whence it has been introduced into the south of Europe, and is also cultivated in Britain, on account of its delicious fruit.—It is propagated from seed, which should be from three to six years old, and be sown at two different periods, in order to obtain a succession of crops. For those of the first season, the seeds may be set about the middle of February, on a cucumber-bed, at a distance of two inches from each other, and covered with a little earth. When a fortnight old, they should be transplanted, and in the course of three additional weeks, finally removed to the bed on which they are intended to remain, and which ought to be in a warm situation, so as to be defended from cold and violent winds.

The second crop should be sown about the middle of March, and treated in a similar manner. But the hot-bed, formed with the view of rearing these tender exotics, ought to evaporate two or three days before it be ready for the reception of the plants, which should be carefully removed, without injuring their fibres. After they are placed on the tops of the hills raised of garden mould above the dung, it will be necessary to water them once or twice, till they have taken root, when their management will vary but little from that of cucumbers, excepting that melons require more air, and a small quantity of water. As soon as the plant spreads into branches, it must be properly clipped, so that only two of the principal shoots may remain; and, in order to produce perfect and ripe fruit, one only should be left on each stem, and all superfluous young melons immediately removed as soon as they appear. Besides, the diseased leaves and branches, together with the forked extremities, ought to be continually cut off; and, when the fruit is *set* or formed, it will be necessary to place thin boards or stones under each, and to turn it gently twice in the week, that the whole may be equally benefited by the sun and air. When fully grown, it must be plucked at a proper time, as it will otherwise lose a considerable part of its flavour. Thus, if melons be intended for the table, they should be cut early in the morning, immersed in ice, or cold spring water, and kept in the coolest place, till they are used. The most certain criterion to ascertain the maturity of this fruit, is its cracking near the footstalk, and beginning to smell; in which state it may be gathered without delay.

In the year 1768, Mr. REYNOLDS communicated to the Society for the Encouragement of Arts, &c. the following method of raising melons without earth, dung, or water. He directs a bed of tanners' waste to be prepared in the month of March, about four feet deep, six feet wide, and twelve feet in length, which is to be covered with four lights, admitting neither rain nor moisture. In the course of three weeks, the bed will acquire a sufficient degree of heat, when a few melon seeds are to be put into warm milk, in an earthen vessel, which is pressed down into the bark-bed, where it remains for the space of 36 hours, in order to promote the vegetation of the seeds. Next, he directs four holes to be made in the bed, at equal distances, each being nine inches in diameter, and five inches deep. These are to be supplied at the bottom with coarsely pulverized oak-bark, resembling saw-dust, to the depth of three inches, into which some of the seeds are to be pressed with the hand, and covered to the thickness of two inches with additional powder; the whole being carefully compressed and levelled. As soon as the plants attain a proper size, Mr. REYNOLDS directs the best to be selected, properly pruned, and to be exposed as much as possible to the sun, during the summer.

The properties of melons, correspond with those of cucumbers: they are however preferable to the latter; being more aromatic, wholesome, and requiring a smaller proportion of spices to counteract their natural coldness.

MELON, the WATER, or *Cucumis Anguria*, L. though properly a species of the former, is by some considered as a distinct genus of exotic plants, comprising three species, of which one only is known in Britain, by the name of *Citrul*. It is cultivated in all the warm countries of Europe, and also in Asia, Africa, and America; where its salubrious and cooling fruit is greatly esteemed.

The water-melon is propagated from seed, in a manner similar to the former; it requires, however, a more open exposure to the air;

and, during cold nights, it will be advisable to cover the glasses with mats, in order to keep the bed warm.—In its properties, this species nearly resembles the preceding; but, partaking more of the nature of cucumbers, water-melons require a larger proportion of spice and wine; as otherwise they are apt to induce flatulency or diarrhœa.

MEMORANDUM, a term implying a note, or mark, made either on paper or otherwise, with a view to assist the memory.

In the present artificial state of society, the convenience of a *memorandum-book* is obvious to every person engaged in active pursuits. And, though the utility of such a measure be universally acknowledged, yet there is reason to believe that it is not so extensively practised as it justly deserves. Those, who reflect on the fleeting nature of human thought, and on the importance of remembering the *train of ideas* which lead to a certain conclusion, will readily admit, that annotations might be rendered equally interesting and useful, if they were extended to that department of human affairs, which more immediately relates to the operations of the human mind.—Thus, if every striking idea, whether of an economical or intellectual tendency, were duly registered, and digested, when a more favourable opportunity offers, incalculable benefit would thence result to society. Hence we presume to suggest to those who are accustomed to reflect and attend to the progress of their reasoning (when in solitude, as well as in the common intercourse of life), to note and record in a particular journal, all such sentiments and opinions, as appear to be worthy of being *preserved*.—See also JOURNAL.

MEMORY, a mental faculty, which consists in the power of reviving former impressions of our ideas, or the particular circumstances which occasioned and accompanied them.

Memory may be divided into two species; *passive* and *active*: the former is the remembering, or recalling of things or events to the mind with little or no effort; the latter is the *recollection* of remote circumstances, or objects, which do not immediately or spontaneously occur. This is a talent of infinite importance to its possessor; and many rules have been given for its direction, improvement, and preservation; but the principal, and indeed the only effectual method, consists in the strictest *temperance* in eating, drinking, and sleep. Excess of every kind clouds the brain, and stupefies the mind: hence we rarely find an intemperate person, whose memory is clear, quick, and tenacious.

Such, however, is the precarious basis of our mental powers, that notwithstanding every effort, it frequently happens that those ideas, which appear to us the most interesting and desirable to be retained, insensibly and irrecoverably vanish from the mind. To assist this inherent weakness, various methods have been proposed; for instance, noting down in a memorandum-book, or journal, the substance of an essay we have perused; or extracting the most important passages from the best authors; or even registering such of our own ideas, as often intuitively or spontaneously occur, in consequence of sudden and unexpected events.

Expedients of this nature constitute the *art of memory*, and those of our readers, who are inclined to avail themselves of such assistance, and to try its effects, may resort to a treatise extant on the subject, and intitled *A New Method of Artificial Memory*.—Let it, however, be remembered, that it is not *extraneous* aid, but constant attention and exercise, which form the true art of memory.

MENSTRUUM, in general, signifies all liquors employed as solvents of other bodies, with the minute particles of which the former combine, so as to produce a new, uniform compound: they are chiefly used for extracting the virtues or ingredients of matters more solid than themselves, by infusion, decoction, distillation, &c.

Water is the solvent of all salts, vegetable gums, and animal jellies. Rectified *spirit of wine* is the menstruum of the essential oils and resins of vegetables, of soap, &c. *Oils* dissolve vegetable resins and balsams, wax, animal fat, mineral bitumens, sulphur, and certain metallic substances, particularly lead: yet, for this purpose, the expressed oils are more powerful *menstrua* than the distilled; because the former are not so liable as the latter to be volatilized in a strong heat, which in most cases is required for enabling them to produce the desired effect.

All *acids* act as solvents of alkaline salts and earths, as well as metallic bodies; but their action greatly varies on different metals: thus, the *vegetable* acids dissolve a large proportion of zinc, iron, copper, tin, and antimony, but particularly lead, if previously corroded by their steam.—The *marine* acid, or spirit of salt, dissolves zinc, iron, and copper; and, if combined with the *nitric* acid, or aqua fortis, a proper menstruum is obtained for gold and antimony.—The *vitriolic* acid, or oil of vitriol, acts upon zinc, iron, and copper: it also corrodes or imperfectly dissolves most other metals.

Alkaline lixivia, or leys, dissolve oils, resinous substances, and sulphur: by adding *quick-lime*, they become more powerful, as is evident in the preparation of common soap. By such addition, the flesh, skin, and bones of animals may be reduced to a jelly.

Solutions effected in water, and spirit of wine, possess the virtues of the substances dissolved; but oils generally sheathe their strength, while acids and alkalies change their qualities. Thus, water and distilled spirits are the proper *menstrua* of vegetable and animal matters, the efficacy of which is to be preserved.

Most of the solutions mentioned are easily made, by pouring the menstruum on the substance to be dissolved, and exposing both, for some time, to a proper degree of warmth.—Oils and alkaline liquors generally require a strong heat to increase their solvent power; and acids, likewise, do not act on some metals without this aid.—Watery and spirituous menstrua may be rendered more expeditious by a moderate heat; and the quantity they hold in solution, will be greater than without this assistance; but, on becoming cold, that proportion of soluble matter which was, in a manner, kept suspended by heat, again subsides.—As the action of acids on metallic bodies is generally attended with heat, effervescence, and a copious discharge of fumes, which are highly inflammable, such as those arising from the solution of iron in the vitriolic acid, the operator ought never to approach the vessel with a candle, or other burning substance; as the exhaling vapour would thus instantly be set on fire, and cause an explosion.

Lastly, there is another species of solution, in which the moisture of the atmosphere is the menstruum. If fixed alkaline salts or earths, for instance, pot-ash, as well as the neutral salts composed of the former, and the vegetable or any other acids (except the vitriolic, and some metallic salts), be exposed for some time to a moist air, they gradually absorb humidity, and at length become liquid; a process which is termed *deliquation.*

MERCURY, or QUICKSILVER *(Hydrargyrus)*, a mineral fluid, about fourteen or fifteen times heavier than water: it is so remarkably *thin*, that it requires the intense cold of 40 degrees below 0, of FAHRENHEIT's scale, to render it solid.—When exposed to fire, it may be totally volatilized.

Quicksilver is found sometimes in a native state, as in the mines of India, South America, Hungary, &c.; but more generally mixed with metals, stone, or other substances, from which it is extracted by various processes. Next to gold, and platina, mercury is the heaviest of all metals, with most of which it unites, excepting iron and antimony: hence it is employed in considerable quantities, for extracting gold and silver from the earthy matters with which they are mixed.—The amalgam, or incorporation of quicksilver with gold, serves to gild copper or silver, so that these metals assume the appearance of gold: when united with tin, it is employed in the manufacture of looking-glasses or mirrors, in the manner already described, p. 125 of the present volume.

Independently of its utility in various manufactures, mercury is extensively employed in medicine; and, though it is the most violent of poisons, when taken inadvertently in too large quantities, yet, if judiciously administered, it has frequently effected a cure, after all other medicines had failed to procure relief. When taken into the stomach undivided, or in its native state, this fluid metal almost instantly passes through the intestines unchanged, and produces no perceptible effect, except that of promoting evacuation, if any crudities or obstructions should prevail in the alimentary canal. Hence it might be advantageously prescribed in the *first* stage of the ILIAC PASSION, before the bowels are too much weakened and corroded by the stagnant feces; especially if it be given together with castor-oil or fat broth, but no spice. The patient, after taking this medicine, should, if possible, walk about the room; and there are instances in which several ounces, nay, half a pound, and upwards, of pure quicksilver, have been swallowed with the happiest effects. But, in the latter stages of obstinate and violent colics, when inflammation and gangrene have already taken place in the bowels, its specific gravity would infallibly rend the intestines, and accelerate the fatal crisis.—On the whole, we think, preparations of mercury are at present too often employed in medicine, under a great variety of forms, both intertially and externally, for many diseases, the nature of which requires a very different treatment. Besides, the animal and vegetable kingdoms supply us with a sufficient number of the most efficacious remedies for removing all *curable* disorders, without the necessity of resorting to the mineral, on almost every occasion.

MERCURY, the Common English. See Perennial GOOSEFOOT.

MERCURY (Dog's). See DOG'S-MERCURY.

MESENTERY, in animal economy, signifies that fat membrane, or membranous duplicature, which is situated in the middle of the abdomen, for preventing the intestines from entangling with each other, as they lie in a small compass. It is nearly of a circular figure, being about four inches in diameter, but from three to four yards in circumference, on account of its plaits or foldings. The bowels are tied like a border around the mesentery; as the former are from ten to twelve yards in length, according to the size of the individual; so that to every inch of this circumference, there are fastened three inches of the latter.

This membrane is by Nature designed to support the intestines in their due place; to strengthen them; and to afford a situation to the milk-vessels (see LACTEALS), glands, nerves, blood-vessels, &c. which are connected with the bowels. From its important use in the animal system, it may be easily conceived that the mesentery is liable to be affected with various diseases, the origin and seat of which are often neither suspected, nor clearly understood. It is, however, certain, that a disordered state of the *mesenteric glands* generally lays the foundation of the rickets, scrophula, wens, white swellings, and early consumption. Hence the injury done to infants, by *stuffing* them with superfluous or improper food; by allowing children promiscuously to eat cakes, gingerbread, and unripe fruit; all of which corrupt the LYMPH (which see), and cannot fail to produce distressing maladies. One of the most fatal, however, is an *inflammation of the mesentery and its glands*; which, though difficult to ascertain, is not a rare occurrence: it is generally accompanied with costiveness, and always with a retention of urine; but seldom with violent fever or pain; and on examining the parts affected, there will appear a large swollen belly, and a deep seated *tension* in the abdomen. Sometimes blood and fetid matter are discharged by stool; and it is remarkable, that male children are more frequently subject to it than those of the female sex; and that the disorder, unlike other inflammations, may prey on the little patient for weeks, before it be discovered; though in acute cases, it proves suddenly fatal.

Cure:—As soon as the nature of this dangerous affection is ascertained, leeches ought to be applied to the lower belly, and a large blister to the small of the back. Emollient clysters, fomentations made of an infusion of chamomile flowers, with the addition of laudanum; and the tepid bath, will also be of essential service.

The patient's *regimen* and *diet* should be similar to that stated p. 12, of this volume: he may likewise drink sweet whey with honey, or equal parts of Seltzer water and milk. With a view to check a debilitating looseness, he ought to take decoctions of the salep-root, sago, tapioca, &c.

METAL, signifies a ponderous, opaque body, which, in general, is fusible by fire; but, when cold, coagulates and concretes into a solid mass, that is capable of being distended under the hammer.—Metals are distinguished by their peculiar brightness, perfect opacity, and great weight: the lightest of them being *seven*, and the heaviest upwards of *nineteen* times more ponderous than an equal bulk of water.

Naturalists have discovered *twenty-one* metallic substances, which essentially differ from each other: they are generally divided into *perfect* or entire, and into *imperfect* or semi-metals. A more accurate classification, however, is that of *ductile* or malleable, the parts of which may be displaced by compression, without being divested of their cohesion; and of *fragile*, or brittle, namely, such as do not admit of being stretched or extended. To the former class belong, gold, silver, platina, lead, copper, mercury, iron, and tin: of the latter are, zinc, bismuth, arsenic, cobalt, antimony, nickel, molybdæna, tellurium, manganese, wolfram, chrome, titanium, and uranium.—Consistently with the plan of our work, we shall describe only the native, and the more important foreign metals, of which the reader will find a concise account in their alphabetical series, interspersed with such facts, as may tend more fully to display their useful properties.

METALLIC, POINTED SUBSTANCES, are often inadvertently swallowed by children and adults:—in such cases it will be necessary to take large draughts of vinegar, lemon-juice, or other vegetable acids, in order to blunt the points of iron, brass, copper, and other fragments or pins; but never to venture on an emetic. If the metallic bodies introduced by the mouth, have been of a round form, or if they happen to be detained within the GULLET, we refer the reader to that article.

METHEGLIN. See MEAD.

MEZEREON, SPURGE-OLIVE, SPURGE-FLAX, or DWARF-BAY, *Daphne Mezereum*, L. an indigenous low shrub, growing in woods and shady places, and flowering in the month of February or March. When cultivated in gardens, it attains, in a rich soil, the height of sixteen feet.

The whole of this plant is so corrosive, that six of its berries are said to be sufficient to kill a wolf.—An ointment prepared from its bark or berries, has been advantageously applied to foul or ill-conditioned ulcers. When chewed, its root occasions ulcerations, and considerable irritation in the throat; but is very serviceable in removing difficulty of swallowing; and Dr. WITHERING (*Bot. Arr.* vol. ii. p. 377), states, that a woman who had been unable to swallow any solids, and liquids very imperfectly, for three years before, was effectually cured in two months, and enabled to take any food without difficulty, by chewing a thin slice of the root of mezereon, as often as she could support its irritating effects.—On sudden emergencies, the root of the Spurge-olive, scraped and applied to the surface of the skin, affords an efficacious substitute for the Spanish-fly, as a blister which speedily operates:—it may also be applied in the form of issues.

Dambourney obtained from the stalks and leaves of the mezereon, a fine *vigogne* dye; and the stalks, alone, imparted a beautiful gold-brown shade to wool, previously dipped in a diluted solution of bismuth.—From the ripe berries of this plant, an excellent red lake is prepared by painters.

MICA, Muscovy-glass, Glimmer, or Glist, a genus of magnesian earths, of which there are two species; viz.

1. The *colorata martialis*, coloured martial glimmer, of which there are many varieties, distinguished by their brown, black, semi-transparent blue, and green shades: they are found chiefly in Lapland, Sweden, and other northern parts of Europe.

2. The *alba*, pure or colourless mica, which contains several varieties, that are found in Siberia and Sweden, and are perfectly transparent; whence it has obtained the name of Muscovy-glass.

Both species consist of thin glittering pieces, that are divisible into leaves, or plates; which, when exposed to a moderate heat, become brittle; but, if placed in a strong furnace, they curl or crumple, and are with difficulty reducible into glass. Mica, however, melts easily with borax, by the aid of which it may be converted into glass, with a blow-pipe.

The broad and colourless mica is used in Russia, as a substitute for glass, to which it is preferable; because it resists the shock on the explosion of a cannon.

MICROSCOPE, an optical instrument, consisting of lenses or mirrors, by means of which, small objects appear of a larger size, than they naturally are to the naked eye.

This valuable instrument, though not entirely unknown to the ancients, was re-invented and made public in the early part of the 17th century: it has, since that period, received continual improvements from various ingenious philosophers and artists, among whom the names of Leeuwenhoek, Wilson, Hook, the Adams's, Lieberkuhn, Barker, Grey, Martin, Di Torre, and Dr. Smith, deserve to be gratefully recorded.

Microscopes are of two sorts, *single* and *double*. The former consist in general of one lens or mirror; but, if a greater number be employed, they only serve to throw additional light upon the object, without farther enlarging its image. Double or compound microscopes are those in which the image of an object is composed of several lenses or mirrors.

The utility of microscopes is very extensive, both to the naturalist and the artist: hence the invention of them must be regarded as one of the greatest efforts of human ingenuity. It is true, they do not contribute in any essential manner to the happiness of mankind; but they serve to unfold the wonders of Nature, and thus insensibly raise the mind to the contemplation of that Great Being, whose works, however minute and apparently insignificant, uniformly evince the highest skill and most perfect symmetry.

MIDWIFERY, or the obstetrical art, a branch of medicine which requires

requires no farther definition.—In most countries of Europe, and in other parts of the globe, it is practised by women; for it comprehends their management both before and after delivery, as well as the treatment of the child during the earliest period of life.

Although we have, in a preceding part of this *Encyclopædia*, referred the reader to the present article, with respect to *after-birth*, yet we cannot, conformably to our plan, enter minutely on the subject. It deserves, however, to be remarked, that every degree of anxiety, or impatient conduct, in midwives and nurses, is highly reprehensible on such occasions; for Nature rarely fails to perform her kind offices to the mother as well as to the infant. Hence it will be found from experience, that those *accoucheurs* are uniformly the most successful in the exercise of their profession, who possess a due share of knowledge of the human constitution, together with a philosophical coolness to resist the solicitous applications made by timorous, and often mischievous relations.—On the whole, we cannot omit this opportunity of expressing our conviction of the benefits which society has already derived from *professional* accoucheurs; and, if the lower classes are still inclined to employ their favourite *midwives*, we trust the day is not far distant, when such persons will be subjected to a rigorous examination of their talents, and qualifications to undertake an office, equally important and fraught with responsibility.—We have ventured to express these sentiments, neither with a view to decry the propriety of employing women (who, if possessed of equal skill and information, certainly deserve the preference) in this primary department of the healing art; nor is it our intention indiscriminately to introduce into families an inexperienced young *accoucheur*, instead of a grave and expert old matron. The former would be an encroachment on female privilege; while the latter might prove a rash and dangerous measure.

MILDEW, or *Erysiphile*, a disease of plants, consisting of a thick, clammy, sweetish juice, that is supposed to exhale from, or descend on, the leaves and blossoms of vegetables.

The mildew occurs most frequently on wheat, hops, the dead nettle, maple, and the gromwell. It sometimes rests on vegetables in the form of a fatty juice; which, being naturally tough and viscous, acquires these properties in a still greater degree, in consequence of its finer and more fluid parts being exhaled by the sun; so that the plants affected by it, cannot perform the important office of perspiration, and thus never attain to maturity.

According to Dr. Darwin, the mildew is a plant of the fungus kind, which vegetates without light or change or air, in the same manner as the generality of mushrooms; and penetrates with its roots the vessels to which it adheres. He suspects, however, the plants affected, to have been previously injured by internal disease; and directs them to be thinned; or to remove those which are contiguous to the diseased, in order to admit more light, and greater ventilation: thus the mildew may be remedied, and the plant at the same time restored to its former vigour.

Common wheat is more subject to this destructive disease than that which is bearded, especially if the land be newly dunged. As, however, it is highly probable, that the greater dampness of some soils, together with their being over-shadowed by too thick foliage, affords one *permanent* cause of mildew, Dr. DARWIN recommends the land to be properly drained; the ashes of coals, bones, or other drier manures, to be employed; and likewise to *thin* the crops. And, as this *mucor* particularly affects late crops, he is farther of opinion, that the seed should be sown early in the season; by which means the mildew will not only be prevented, but a forward crop will be obtained.

Where this disease has already infested the plants, a brisk shower of rain, succeeded by a smart wind, is believed to be the most efficacious remedy, to prevent its farther progress. If the mildew be observed before the sun rises to its meridian power, it will be advisable to send two men into the field, furnished with a long cord, of which each should hold one end: by dexterously drawing this rope over the ears of corn, the dew will be removed, before the heat of the sun dries and reduces it to that viscous state, in which it obstructs the perspiration of plants. Lastly, it has been confidently asserted, that lands, which have been affected with the mildew for several successive years, have been effectually cured by sowing *soot*, either together with, or immediately after corn; and that hop-plantations may be secured from its injurious effects, by manuring them with hogs'-dung.

M. SEGER, in his valuable German *Treatise on the Mildew, considered as the principal cause of Epidemic Diseases among Cattle*, &c. (published at Vienna in 1775), observes, that the mildew is so sharp and corrosive, as to raise blisters on the feet of shepherds who go with naked feet; and that it even consumes the hoofs of cattle. He supposes it to be a kind of rust, and to possess some arsénical properties. Its pernicious influence is rendered still more powerful by a variety of circumstances; such, as sending cattle into the fields too early in the spring; suffering them to drink water mixed with ice; or keeping them in close, filthy stables, that are not sufficiently aired.

M. SEGER likewise conceives the *mildew* to be a principal cause of epidemical diseases in cattle.—The particular species, producing such distempers, is that which burns the grass and leaves. It falls usually in the morning, especially after a thunder-storm; and its poisonous properties (which do not continue above twenty-four hours) never operate, unless the mildew be swallowed immediately after it has fallen.—The disease first affects the stomach, and is accompanied with pimples on the tongue, loss of appetite, a cough, and great difficulty of respiration. As a preservative, the ingenious author directs cattle to be well purged, both in the spring and in winter; for which purpose he prescribes half a dram of sulphur of antimony, and a whole dram of resin of jalap, for one dose:—he concludes with cautioning the proprietors of cattle, carefully to avoid the use of emetics, and every thing that is of a heating or irritating nature; because

cause such treatment would be productive of fatal consequences.

Milfoil. See Common Yarrow.

MILIARY FEVER, or *Miliaria*, a disease which affects both sexes, at every age, but particularly recluse and sedentary women. It is accompanied with continued fever, anxiety, a sensation of punctures in the skin, and profuse unctuous sweats.

Causes.—Excessive watching; the indulgence of the more violent passions; suppression of the natural discharges, as also too great evacuations; eating of unripe fruit, and similar pernicious trash; a weak watery diet, and impure or putrid water. It is, in general, a primary disease, though it is sometimes consequent on quartan and puerperal fevers.

Peculiarities.—The miliary fever, though not contagious, is an epidemic disease, and sometimes a *critical* symptom in the autumnal putrid fever. It generally commences its attack with a cold shivering, which is succeeded by intense heat, pain in the head and loins, oppression on the breast, and difficulty of breathing. An itching and prickling sensation is felt in the skin, which, between the seventh and fourteenth days, is covered with numerous small, red, and distinct pimples, that appear first on the neck and chest, and gradually spread over the whole body, excepting the face. This eruption is usually preceded by profuse sweating; and, in the course of two or three days, the tops of the pimples are filled with small white vesicles, which speedily disappear. In the course of a few days, the pustules assume a yellowish cast, and at length totally vanish, leaving the skin covered with branny or mealy scales.

Cure.—In this, as in all other eruptive fevers, the chief point is, to prevent the pustules from *striking inwards*; as the patient is then in the most imminent danger. In the first period of the disease, blood-letting will, in general, be necessary; and, if the eruption appear and disappear, repeated small blisters may be advantageously applied. It will likewise be advisable to administer, frequently, gentle laxatives; but, if the patient be in a languid state, and the bowels become regular, the liberal use of Peruvian bark will essentially contribute to his recovery. During the whole progress of this fever, he ought to be kept uniformly cool; his diet also should be cooling and nutritious, and adapted to his strength and constitution. Lastly, as soon as he is able to encounter the air, gentle and daily exercise will be attended with the best effects.

MILK, a well-known, nutritious fluid, with which Nature has wisely furnished the breasts of females, and the udders of animals, for the support of their young.

Milk consists of three parts, namely *caseous*, *butyrous*, and *serous*. The first comprehends the grosser earthy particles, which serve to suspend the butyrous part; and which, when coagulated by art, are formed into Cheese. The second ingredient comprises the *butyraceous* or oily particles, or cream, which float on the surface of milk, and are by agitation converted into Butter. The *serous* are the more watery parts, constituting what is called Whey, and serving as a vehicle for the two before stated.—The most wholesome milk is that which contains a due proportion of the three constituent parts.

Having already discussed the qualities, as well as the methods of preparing BUTTER, BUTTER-MILK, and CHEESE, under those respective heads, we shall briefly consider the properties of milk, afforded by different animals, as an article of food.

The milk of women, mares, and asses, nearly agree in their qualities, being very dilute, sweet, though acescent, and, when coagulated, easily *broken down*. That of cows, goats, and sheep, possess properties widely different. Of these, cows'-milk approaches nearest to that yielded by the female breast. But the milk obtained from goats, is of a peculiar nature; as its oily and coagulable parts do not separate spontaneously, throw up no cream, and yield no butter. That of sheep is rich and nourishing; produces abundance of butter, but which is so unpalatable as to render it unfit to be eaten. Both these fluids afford a large proportion of strong and tough cheese.

Cows' milk forms a very essential part of human sustenance, being adapted to every state and age of the body, but particularly to infants, after being weaned. It should, therefore, be drawn from sound, young, and healthy animals; as it is most nutritious, when these are between three and four years old.—Good milk is perfectly white, and totally divested of smell. As, however, it contains a great portion of the fatty or oily particles, known under the name of cream, it ought always to be diluted with water, before it is given to children.—But, to scorbutic persons, or those troubled with inveterate ulcers, it will be found of great benefit, in a pure, undiluted state; as it combines both saccharine and oleaginous particles.

From its balsamic nature, milk promotes the different evacuations, especially insensible perspiration: in a *serous* or diluted state, it has often afforded considerable relief in obstinate coughs; in disorders induced by worms, hysterics, the putrid sore-throat, the gout, and stone, and various other diseases, with which mankind are afflicted. But, if a person be debilitated, or otherwise exhausted by sickness, milk ought by no means to be used; as it is apt to generate cramps or violent spasms in the stomach, the heart-burn, &c. Corpulent and plethoric persons; those who are recovering from febrile complaints; and particularly such as are accustomed to drink wine, and spirituous liquors, cannot with advantage or safety adopt a *milk-diet*; because the fatty and viscid properties of that fluid tend to oppress the stomach, and occasion indigestion.—When milk is used *medicinally*, it ought to be taken as speedily as possible after it has been drawn from the cow; for its most nourishing and attenuating particles exhale, if it be boiled, or even for a short time exposed to the air.

Lastly, if milk be suffered to become *sour*, it cannot be easily digested: and, though it is in that state unfit to serve as an article of beverage, its utility does not cease. There is a liquor, distilled from acid milk, butter-milk, or whey, which is asserted to be a valuable menstruum in the preparation of colours.

Milk being of such extensive utility, both as food and medicine, our readers will probably expect some account of such vegetables as are calculated to increase the quantity of that sweet and wholesome fluid. One of the most effectual methods consists in giving cows, every morning, decoctions of the richest and most fragrant species of clover, and especially of *lucern.*—This subject has already been concisely discussed under the article CATTLE (vol. i. p. 459); and, as we state the *lactiferous* plants in their alphabetical order, it would be superfluous to repeat them in this place:—they will also be registered in the General Index of Reference.—But we cannot omit to animadvert on the culpable filthiness in which cows are confined, both in the metropolis, and in its vicinity, where these useful animals are literally *crammed,* not with wholesome food, but with such matters as are calculated to produce an abundance of milk. This unnatural practice, however, would in some degree be *venial,* if that milk were vended in a *pure* state. It is, indeed, a notorious fact, which we think our duty to state, that vessels both of hot and cold water, are always kept in the cow or milk-houses, for the accommodation of mercenary retailers. These persons purchase a certain quantity of *unadulterated* milk, and at a low price; but, as each must make his or her profit, they mix with it such a proportion of water as they may think necessary to make their milk of a *sufficient standard;* when it is hawked about at the present exorbitant price.—Circumstances of this fraudulent complexion ought to be more generally known; and we trust that the vigilance of the police will soon be extended to the suppression of practices and abuses, equally bold and iniquitous.

Skimmed milk, is that which remains after the cream has been taken off its surface. It is often sold for new milk, and employed in considerable quantities by wine-merchants, for the purpose of clarifying, or fining down turbid *white* wines, arrack, and weak spirits; but it should not be used for *red* wines, as it discharges their colour.—This kind of milk is also useful for *whitening* such wines, as have acquired a brown tint, either from the cask, or in consequence of having been boiled, before they had undergone the vinous fermentation. In such cases, a little skimmed milk precipitates the colour, leaving the wine almost limpid, and of a pleasant flavour.—A fluid of such harmless nature is in every respect preferable to the noxious matters, with which avaricious vintners poison their turbid or damaged wines.

THE MILK OF THE FEMALE BREAST is frequently very troublesome to delicate women, and subjects them to many disorders. The more common of these are:

1. Deficiency of this nourishing fluid, which is often occasioned by the indulgence of anger, or other passion; worms; or intestinal complaints. Those who are advanced in years, before they become mothers, are particularly liable to this complaint, which is likewise induced by poor aliment, or some constitutional defect in the fluids. If the latter cause be obvious, it will be adviseable to administer absorbent powders; but, if it originate from parsimonious living, the patient's diet ought to consist of rich cows' milk, and light nourishing food. Should,

however, such deficiency be *absolute*, and the breasts be totally devoid of this salutary fluid, the only method of preserving the infant's life will be, to procure a careful, healthy wet-nurse.

2. Excess, or evident abundance of milk, occurs as frequently as the contrary; and requires the greatest attention; for, otherwise, inflammation and abscesses in the breast may be the consequence. Hence the patient should live sparingly, and suckle two infants, with a view to diminish the too rapid flow of milk.

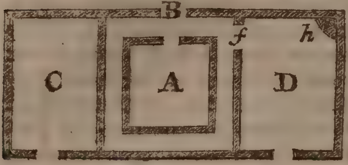
3. The *Milk-fever*, one of the most alarming diseases of females, is sometimes occasioned by terror, taking cold, &c. though it is more frequently induced from a false principle of delicacy, by neglecting to put the infant to the breast. It occurs, in general, a few days after delivery, and requires to be treated with the utmost precaution. To check its progress, it will be necessary to resort to camphorated clysters, gentle evacuations, and embrocations of linseed and similar emollient oils. The infant ought, likewise, to be put frequently to the breast; and, if no relief be thus obtained, they should be drawn, either by means of the small air-pump, or some expert person. The patient's diet ought to be light and cooling; but, if the fever prove violent, and be accompanied with putrid symptoms, it will be adviseable to administer Peruvian bark liberally, and to obviate costiveness, by gentle laxatives.—One of the most effectual preventives of this fever is, to place the infant to the breast as early as possible; a practice which cannot be too strongly recommended; as the life, or at least the health, of many valuable mothers might be spared, if such method were more generally followed. The apartment ought to be carefully aired; and, if the breasts abound with milk, at the commencement of the fever, they should be occasionally drawn: thus, that fluid might effectually be prevented from acquiring an unnatural acrimony, or from being absorbed, while in a corrupted state.

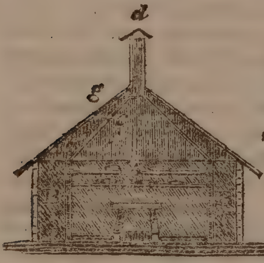
Violent passions and affections of the mind must be studiously avoided by those who suckle children; for, such irregularities not only lay the foundation of the most painful disorders in mothers or nurses, but also injure the innocent babes, by inducing painful, and often fatal diarrhœas. In every instance, after sudden fright, or a fit of passion, it will be advisable to squeeze, or gently agitate the breasts, in order to discharge the redundant milk, before the infant be permitted to suck.—Lastly, if the breasts become turgid, and there be an apprehension of the milk coagulating in them, shortly after parturition, it will be requisite to present them to the infant; provided it be sufficiently strong: in the contrary case, another child or adult should draw them, and thus diminish the superfluous and hurtful part.

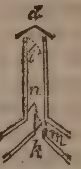
MILK-HOUSE, a building designed for the reception and preservation of milk, previously to its undergoing the various processes of the dairy.

As we have already, under the head of Dairy-house, treated of the utensils, &c. proper for the management of milk, we shall now lay before our readers a cut, representing a Milk-house, upon an improved

proved plan, by the industrious Dr. **Anderson.**







Description of Dr. Anderson's Milk-house, *with its appurtenances.*

The uppermost of the three figures represents a section of the whole structure.

A, the dairy in the centre, surrounded by open passages.

B, the entry to the dairy from the north.

C, the ice-house.

D, the scullery, or wash-house, with the door or entrance from the south, and benches placed beneath.

f, a door, which communicates with the milk-house, &c.

h, the fire-place.

The lowermost of the three figures, is an elevation of the milk-house A.

B B, the passages round it.

c, the interior window.

d, the ventilator or air-pipe.

g, the exterior window.

The smallest of the figures above given, is a delineation of the ventilator.

i, represents the valve at the top,

k, another valve at the bottom, which communicates with the milk-house.

n, a similar valve, with the passage.

The whole of this structure ought to consist of a range of narrow buildings, as in the section first delineated, where the middle division marked A, represents the *milk-house*, properly so called. Dr. Anderson directs it to be built with a double wall, so that a current of air may continually pass, for the purpose of preserving a regular, cool temperature; the inner wall being constructed with lath or bricks, doubly plastered on both sides; and the outer one, consisting of plastered lath: both being carefully worked, so as to render them perfectly air-tight.

The entrance to the dairy ought to be on the north side B; but it will be requisite, for greater convenience, to make another communication through the door *f*, into the front-room, especially during the winter, when the outer door B, should be kept continually shut. The external roof ought to be constructed with tiles, or slate, while the inner one should be made of plaster, closely applied. Between both, it will be necessary to leave a vacant space, at least four feet wide, for the free passage of air, as delineated in the elevation above given; in which the letter A, represents the inside of the *milk-house.* The letters B B, designate the area between the two walls, that gradually diminishes towards the top, till it terminates in the ventilator or wooden chimney *d*;

which ought to be constructed, on three sides, with planks or boards lined with plaster; the fourth, or south front, should consist wholly of glass, carefully closed with putty, so as to render it completely air-tight. Its dimensions may vary at pleasure, from one to two feet in diameter, internally; but it should be elevated at least six or eight feet above the roof; as its effects will be more or less powerful, according to its length.

This tube is furnished at the top with a valve *i*, placed immediately beneath the air-holes, which may be closed when required; and at the bottom is a similar valve *k*. The lower pipe, which communicates with the milk-house, is considerably smaller than the upper tube just described. The opening *m*, is closed on one side; and at *n* is a valve, which, when shut, prevents any communication between this pipe and the external area.—Farther, the top of the ventilator is covered with boards, placed in the form of a roof, so that the rain may be thrown off, without impeding the current of air; while, by means of the valves above-mentioned, the air, heated by the action of the sun through the outer wall, will immediately escape, thus constantly preserving a due temperature; and, by the same means, all damp and confined air, which is extremely pernicious in dairies, will be constantly expelled.

The building is furnished with a window placed along the slanting interior roof at *c*, and which is closed down with putty, to prevent it from being opened. Another window, *g*, is fixed over it in a similar manner on the external roof, so as to transmit the light, without impeding the current of air between the two glasses.

The passage round the milk-house ought to communicate with the external air below, only at the threshold of the door B. But it will be necessary to make a small aperture on every side, about one foot in height from the floor, in order that such area may be occasionally ventilated. Each of these apertures should be secured with a piece of thin wire-work, in order to prevent the approach of insects, or other vermin; and ought likewise to be furnished with a door, or cover, by which it may be opened, or closed, according to circumstances. Farther, if this passage be furnished with shelves, and lighted by a glazed window from the inner apartment, so as to admit *light only*, it may be advantageously converted into a pantry for keeping butter, cheese, &c. perfectly cool, independently of its use for preserving the temperature of the milk-room.

The whole of the interior apartment should be finished with hard plaster neatly smoothened, and totally devoid of ornament, so that it may be cleaned as often as becomes necessary. In its centre, Dr. ANDERSON directs a large stone table to be placed, being about 2½ feet high, 3 feet wide at the least, and of a breadth proportioned to the length of the room. Beneath the table is to be fixed a stone trough, corresponding to the length and breadth of the former, and being about one foot deep, that is, six inches above and below the floor of the milk-house. From the bottom of the trough, a pipe is to be conducted, for the purpose of carrying off the water: and, in case it be supplied by a running stream, it will be requisite to make one side of such trough somewhat lower, that the water may run over, and thus be carried out of the house. The floor of the building should be constructed with stones neatly laid; and, if these be easily attainable, the shelves, delineated in the elevation above given, should be hewn out of the same materials: otherwise, they may consist of wooden planks.

If the milk-house be situated near a large town, where ice could be vended during the summer, Dr. ANDERSON is of opinion, it would be very beneficial to the owner, to erect an ice-house contiguous to this dairy, as represented at the letter C, in the uppermost cut above given. He recommends it to be surrounded by a double wall on three sides, with a passage or area intervening, as in the dairy. The receptacle for the ice ought to be formed of upright posts, lined with wattled-work of wands, or with close rail-work, but so as to leave a walk two feet and a half wide every way; round which a gutter should be made to carry off such water as may drain from the ice. This is, in his opinion, the cheapest method of building an ice-house, in any situation; and is far preferable to the usual mode of making vaults, which are not only more liable to be damp, and become mouldy, but are also far more expensive, and by no means so well calculated to preserve a gentle coolness, and an equal temperature, at every season.

The apartment, marked with the letter D, is designed as a repository for the utensils of the dairy, in which they may be cleaned and arranged. For this purpose, it will be advisable to place shelves round the walls, together with tables, and such other articles as may be found necessary. Its entrance should be from the south, where the roof projects about two feet over the wall, as at *f*, which door communicates immediately with the milk-house, and may be occasionally opened in the summer; but which alone ought to be used during the winter, when the chief entrance B, should be constantly shut. At one end of this apartment is a fire-place, on which a cauldron, proportioned to the size of the dairy, ought to be fixed; in order that there may be a continual supply of warm or hot water.

Such is the outline of Dr. ANDERSON's ingenious plan, which appears to be well calculated to enable attentive dairy-men, to keep their milk of an equal temperature at all seasons, while they may, at the same time, carry on the necessary operations with little trouble or expence.—Those of our readers, who wish to become more intimately acquainted with the whole economy of the milk-house, will not without instruction peruse Dr. ANDERSON's *Practical Remarks on the Management of the Dairy*, which were originally published in the 5th vol. of the *Letters and Papers of the Bath Society*; but which have been considerably enlarged in the 3d vol. of the new series of his valuable miscellany, entitled *Recreations in Agriculture, &c.*

MILK-THISTLE, or LADIES' THISTLE, *Carduus marianus*, L. an indigenous plant, growing on ditch-banks, road-sides, the borders of corn-fields, and on rubbish: it flowers in the month of August.

Though often a very troublesome weed in pasture and other lands, the milk-thistle may be eaten in the spring as a salad: and the tender stalks, if peeled and soaked in water to extract their bitterness, afford a delicious dish: the scales of the flower-cup may be used as a substitute for artichokes; and the roots, as well as the leaves, while young, are wholesome food.—Rabbits, likewise, are exceedingly fond of the leaves and stalks of the milk-thistle, which tend to preserve their health, when kept in a domestic state.

MILK-VETCH, or *Astragalus*, L. a genus of indigenous, perennial plants, consisting of 80 species; the principal of which is the *glycyphyllos*, Common or Sweet Milk-vetch, Liquorice-vetch, Wild-liquorice, or Liquorice Cock's-head: it grows in meadows, pastures, and on ditch-banks, where it flowers in the months of June and July.—This plant will thrive with uncommon luxuriance in poor barren soils; and yield an abundance of tender and succulent herbage. Its cultivation has, therefore, been strongly recommended by Dr. Anderson, who observes, that it would be an excellent winter-fodder for cattle, which devour it with avidity.—Cows depastured on this plant, are said to yield an abundance of rich milk; from which circumstance it has received its most proper English name.

MILK-WEED, the Marsh, Wild Parsley, or Wild Milky Parsley, *Selinum palustre*, L. an indigenous perennial plant, growing in damp and marshy situations, where its stalk attains the height of three or four feet; and flowering in the month of June or July.—Every part of this vegetable, on cutting it, exudes a milky juice: its aromatic root may serve as a substitute for exotic spices in medicine, and for culinary purposes: the Russians use it instead of ginger, and the Laplanders chew it in the same manner as tobacco.

MILK-WORT, the Common, or *Polygala vulgaris*, L. an indigenous perennial plant, thriving on heaths and dry pastures; flowering in the months of June and July.—This herb is eaten by cows, the milk of which it remarkably increases; also by goats and sheep, but is refused by hogs.—Its roots possess an extremely bitter taste, together with all the virtues of the American rattlesnake-root.—According to Du Hamel, it is given with success in pleuritic cases, operating as a purgative, emetic, and diuretic. A spoonful of the decoction, made by boiling an ounce of the herb in a pint of water, till one half be evaporated, sensibly promotes perspiration as well as expectoration, and has therefore been used with advantage in catarrhal fevers and defluxions on the lungs:—three spoonfuls of this medicine, taken every hour, have sometimes afforded considerable relief in dropsical cases.

Milkwort, the Sea. See Black Saltwort.

MILL, a machine for grinding corn, &c. of which there are various kinds, according to the different methods of applying the moving power; such as water-mills, those worked by horses, wind-mills, &c.

Without discussing the mechanical construction of this valuable contrivance, we shall, conformably to our plan, omit the less interesting patents granted for inventions or improvements, and present to our readers an account of Mr.

Thomas Rustall's parish, or family-mill and bolter; for which the Society for the Encouragement of Arts, &c. in 1800 voted him a premium of forty guineas.

Description of the Plate representing Mr. Rustall's Family-Mill and Bolter.

Fig. 1. A, the handle of the mill.

B, one of the mill-stones, which is about 30 inches in diameter, and 5 inches in thickness, moving with its axis C.

D, is the other mill-stone, which, when in use, is stationary; but which may be placed nearer to, or at a distance from, the moveable stone B, by means of three screws passing through the wooden block E, that supports one end of the axis C; after it has been put through a hole or perforation in the bed-stone. The grain likewise passes through this perforation from the hopper F, into the mill.

F represents the hopper, which is agitated by two iron pins on the axis C, that alternately raise the vessel containing the grain, which again sinks by its own weight. In consequence of this motion, the corn is conveyed through a spout, that passes from such hopper into the centre of the mill behind, and through the bed-stone D.

G, a paddle, regulating the quantity of corn to be delivered to the mill; and, by raising or lowering which, a larger or smaller proportion of grain may be furnished.

H, the receptacle for the flour, into which it falls from the mill-stones, when ground.

I, represents one of the two wooden supporters on which the bed-stone D, rests. These are screwed to the block E, and likewise morticed into the lower frame-work of the mill at K, which is connected by means of the pins or wedges L, L, L, that admit the whole mill to be easily taken to-pieces.

M, a fly-wheel, placed at the farthest extremity of the axis C, and on which another handle may be occasionally fixed.

N, a small rail, serving to keep the hopper in its place; the farthest part of such hopper resting on a small pin, which admits of sufficient motion for that vessel, to shake forward the corn.

O, a spur-rail, for strengthening the frame-work of the mill.

P, the front upright, that is morticed into the frame-work, and serves as a rest for the end of the iron axis C, which is next to the handle.—On each extremity of such axis, there is a shoulder, which keeps it steady in its place.

Lastly, there is a cloth-hood fixed to a broad wooden hoop, and which is placed over the stones while working, to prevent the finer particles of flour from escaping.

Such is the outline of Mr. Rustall's useful mill; but, as a bolter, or sifter, becomes necessary for separating the flour from the bran, he has contrived a machine upon a simple and excellent construction, of which the reader will find a delineation in the same plate.

Fig. 2, represents this bolter, with its front removed, in order to display its interior structure; the machine being three feet ten inches in length, 19½ inches in breadth, and 18 inches in depth.

A, is a moveable partition, sliding about four feet backwards or forwards, from the centre of the box, upon two wooden ribs, which are

Mr. Thos. Rustall's Family Mill & Bolter.

Fig. 1.

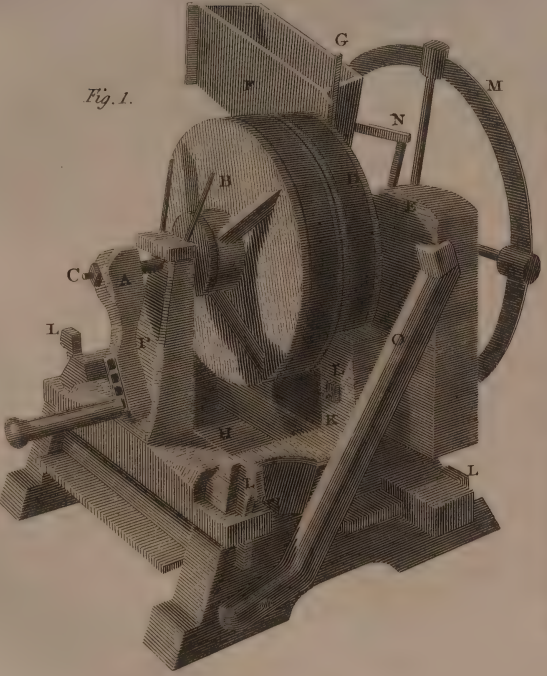


Fig. 3.

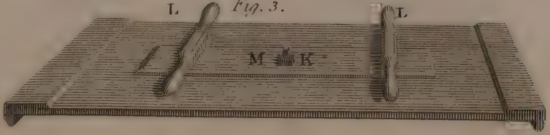


Fig. 2.

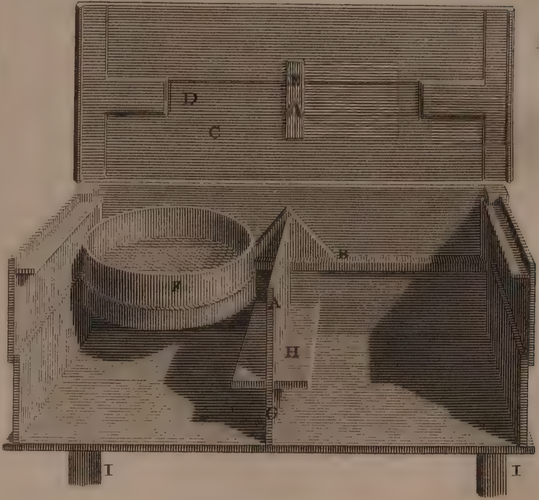
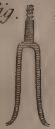


Fig. 4.



are fixed to the back and front of the box, and one of which is delineated at the letter B.

C, the lid of the bolter represented open.

D, a slider, which is moveable in a groove made in the lid, by means of two handles on the back of such lid.

E, a forked iron, fixed in the slider D; and which, when the lid is shut, takes hold of the edge of the sieve F, and moves it backwards and forwards on the wooden ribs B, according to the agitation of the slider.

G, represents a fixed partition in the lower centre of the box, which it divides into two parts, in order to separate the fine from the coarse flour: from this partition, the slider A, moves each way about four inches, and thus affords room for working the sieve.

H, a board that is parallel to the bottom of the bolter, and forms part of the slider A. This board serves to prevent any of the sifted matter from falling into the other partition.

I, represents two of the back feet which support the bolter.

Fig. 3, of the plate above mentioned, is a view of the top, or upper part of the lid of the bolter.

K, the slider that moves the lengthwise of the bolter.

L, L, the handles by which the slider is worked.

M, a screw, serving to hold the fork, which imparts motion to the sieve.

Fig. 4, represents the forked iron, E, separately from the lid.

Mr. Rustall's inventions are equally ingenious and economical: they bid fair to be of very general utility; as both the mill and bolter may be constructed at a moderate expence, and occupy only a small space of ground. The former may even be worked in a public kitchen, or within a room in a farm-house, without occasioning any great incumbrance.

The particular excellence of the mill consists in this circumstance, that, from the vertical position of its stones, it may be put in action without the intervention of cogs or wheels. It may be employed in the grinding of malt, the bruising of oats for horses, and for making flour, or for all these purposes: it may likewise be easily altered, so as to grind either of those articles to a greater or less degree of fineness.

Another advantage peculiar to Mr. Rustall's contrivance is, that one man is sufficient to work it; though, if two persons, namely, a man and a boy, be employed, they will be able to produce, in the course of two hours, a quantity of flour sufficient to serve a family, consisting of six or eight persons, for a whole week:—repeated satisfactory trials have proved, that this mill grinds the corn completely, and at the rate of one bushel of wheat within the hour.—Besides, the industrious farmer will thus be enabled to make comparative experiments, on the quality of his grain, and may furnish himself, at a trifling expence, with flour from his own wheat; without apprehending any adulteration; or without being exposed to the impositions, or caprice, of fraudulent and avaricious millers.

Lastly, though Mr. R.'s bolter be more particularly calculated for sifting flour, it may also be applied to various other useful purposes, and especially with a view to obviate the inconveniencies necessarily attendant on the levigation of noxious substances, and to prevent the waste of their finer particles.

The original mill may be inspected in the Repository of the Society for the Encouragement of Arts, &c. Adelphi; and we understand from Mr. Taylor, the Secretary to this patriotic association, that the inventor of the machinery, Mr. Tho. Rustall, wheelwright, of Purbrook-heath, near Portsmouth, engages to furnish the whole apparatus, and to deliver it free of carriage, in London, for the moderate price of *twenty guineas*.

MILL-REEK, a dreadful disease, caused by the poisonous fumes of melted lead, which affect not only those who are employed in the smelting or preparing of that metal, but likewise all who reside near the mines whence it is dug, or contiguously to the furnaces, &c. where it is worked.

On the first attack of this disease, the patient feels a weight and uneasiness in the region of the stomach, and a slight degree of colic in the bowels: the pulse is low; the appetite impaired; the legs become feeble, and the whole body is debilitated. Sometimes these symptoms abate in consequence of a slight diarrhœa; though, if the latter continue for some time, it is always attended with danger.

At first, however, the patient is not prevented from following his usual occupations; but, if the disorder progressively increase, and he neglect to apply for relief, the next symptoms will be, obstinate costiveness, violent pain in the intestines; a troublesome giddiness, insensibility, and delirium. The extremities become convulsed; the pulse intermits; and, at length, the highest degree of palsy, or apoplexy, closes the distressing scene.

As the *mill-reek* is of a similar nature and origin with the *Devonshire-colic*, of which we have already treated under the article Lead, we refer the reader to p. 73 of the present volume, where he will find a short account of its most successful treatment.—We cannot, however, conclude this article, without recommending the following precautions (from the first vol. of the Edinburgh *Essays and Observations, physical and literary*, &c. 8vo. 1754) to the attentive consideration of the humane. It is a duty incumbent on all those persons who are in any manner connected with the manufacture of lead, or who reside in the vicinity of lead-mines, to spread and inculcate the means of rescuing many industrious members of society from a most painful death; or, if a person be attacked by this terrible disease, to contribute their share towards preserving them from feeling its extensive horrors.

1. No labourer should be suffered to repair to his work, *fasting*; his food ought to be fat and oily, and it would be very beneficial, if he were to drink a glass of sweet oil, either pure, or mixed with a little brandy, every morning.

2. It will be advisable to take some aperient physic, not only in the spring and in autumn, but likewise, as often as any symptoms of the mill-reek, however slight, are perceived.

3. No spirituous liquors should be allowed, or at least, be very sparingly used, especially while the labourer is at work, or immediately after it.

4. No workman in a state of perspiration must expose himself

to the cold air; but he should retire to his home, as speedily as possible; and, after having changed his clothes, cool himself gradually.

5. Immediately after the labourer returns from his work, he ought to take some nourishing aliment, which should principally consist of fat broths, or similar liquids.

6. The diet should be wholesome and nourishing; because scanty or poor food disposes such persons to be more frequently affected, and renders them too feeble to undergo a complete cure.

Lastly, as often as their employment will permit, they ought to visit an open country, where they may breathe an untainted air, and find provisions free from the noxious fumes of lead. Particular care must, however, be taken not to venture upon long journies; because such persons will be more fatigued, and reduced, by travelling one day, than by labouring two days in the lead-mines.

MILL-STONE, signifies the large circular stone, by means of which, when put in motion by machinery, corn is ground into flour.

The diameter of the common mill-stones is, in general, from five to seven feet, and their thickness varies from 12 to 15 or 18 inches. They usually endure 35 or 40 years; and, when they have been employed for a long time, so as to be considerably diminished, they are *edged*, or cut anew, in order to communicate to their surface a figure contrary to that which they originally bore; afterwards the upper mill-stone is made the lower, or bed-stone.

These stones are an article of extensive utility, and were formerly imported in great numbers from France: the *Burr-stones* of that country having been found harder and more durable than any that were dug out of British quarries.—To prevent the national expence incurred by such importation, the patriotic Society for the Encouragement of Arts, &c. offered a liberal premium for the discovery of a quarry of mill-stones similar to the *French burrs*; which desirable object was attained in 1799, by Mr. RICHARD BOWES, of Conway, in North Wales, to whose widow the Society, in 1800, voted the reward of 100l.

The quarry which Mr. BOWES discovered, extends to a very considerable distance from the town of Conway. The stone dug from it, appears, from its external characters, to consist of quartz and cherts. When first taken out of the soil, it is much softer, and more easily wrought into its proper shape, than after it has been exposed to the air, though only for a day. The vein in the quarry contains every variety of the stone, whether cellular, close, hard, or soft, and runs to such a depth, that the industrious discoverer considered it as *inexhaustible*.

Numerous certificates from the most respectable persons have been sent to the Society above mentioned, all of whom agree in stating, that the Conway-stone will form a very valuable substitute for, and answer every purpose of, the French *burr-stones*.

In the year 1796, a patent was granted to Mr. MAJOR PRATT, for his invention of a method of manufacturing a composition-stone, calculated for grinding corn, and various other articles, in the same manner as is effected by the common mill-stones. His artificial compound is stated to consist in mixing certain proportions of siliceous and argillaceous earths (that can only be ascertained by practice), with about one-seventh part of calcareous earth. These are exposed to a fire, heated to the degree usually required in calcining lime, for the space of twenty-four hours, or such farther period as experience alone can determine; after which the composition may be formed into durable stones, that are said to afford proper substitutes for those compounded by Nature.

MILLET, or *Milium*, L. a genus of plants, consisting of five species; of which the following are the principal; namely:

1. The *panicum*, or Common Millet; which is a native of India, and seldom cultivated in Britain, except in gardens, for the sake of its small round seed, that affords grateful food to poultry. It may, however, be easily propagated, by sowing it in the beginning of April, upon a warm dry soil, but not too thick; because the plants, when growing, expand, and require much room. Hence they should be kept clean from weeds, at their first shooting up. In August, the seed attains to maturity; but, if exposed to the depredations of birds, they will devour it as soon as it begins to ripen.—There is a variety of this species, called the *African Millet*, the culture of which has been recommended by M. Tschiffeli, of Switzerland. It flourishes in every soil, requires neither rich manures, nor laborious tillage; and it is not devoured by birds, nor does it exhaust the soil, though affording very abundant crops.—Another variety of this species is the *panicum germanicum*, cultivated in Germany and the south of Europe; and which, according to M. Buse, of Erfurt, thrives in a good clayey soil, where it sometimes produces more than thousand-fold returns.

2. The *effusum*, Millet-grass, or Soft Millet; which is a native of Britain, grows from five to six feet in height, in moist shady woods; and flowers in the months of May and June.—This plant is very beautiful; and, though it has no useful property to recommend it to the industrious farmer, yet it deserves to be cultivated in shady gardens, on account of its fragrant odour.—Its seeds are eaten with great avidity by linnets.

Besides its utility for feeding poultry, millet is highly esteemed for making puddings, and by many preferred to rice. As an article of food, however, it is by no means equal either to blanched oats, or barley, and ought not to be eaten by persons whose organs of digestion are weak, or impaired.

MINERAL KINGDOM, an expression comprising all bodies that are dug out of subterraneous places, or *mines*, being totally inanimate, and devoid of the power of vegetation.

From the preceding definition, it is obvious that *minerals* are *inorganic* substances which, like organized bodies, have a certain origin, progressively increase, and are subject to dissolution, or a decomposition of parts. But they arise merely by an accumulation of homogeneal, or similar particles from *without*, namely, either by substances combining in consequence of their attractive power, which process of Nature is called *cohesion*; or by the solid particles being separated from the fluid ones, when the former attract each other, according to certain laws, constituting together a solid body; and this is termed *crystallization*, a form of which only certain minerals are susceptible.—Most metals, however, are supposed to take their origin from the contact or accumulation of *mineral* or *subterraneous fumes* and *vapours*; because the latter, which float in mines and metallic veins, at length penetrate into the particular fossil exposed to their action, and produce *ore*; or, they combine, each according to their peculiar species, and afford *native* metal.

With respect to the origin of minerals, it is probable that, in some kinds of them, a *gradual* refinement and change takes place within the bowels of the earth. It is also remarkable that, in the southern hemisphere, there is a greater profusion of precious metals; and these are nearer the surface of the earth, than in the northern regions.

Minerals increase in bulk only while they remain undisturbed in their natural situation; but, by exposing them to the air for a sufficient length of time, they are decomposed, or crumble to pieces, without strictly decaying, such as is the case with organized bodies.

Mineralogists divide the mineral kingdom into four classes, namely,

I. Earths and stones.

II. Salts.

III. Inflammable bodies; such as sulphur, bitumens, amber, rock-oil, sea-coal, &c.

IV. Metals.

Of these, however, we cannot in this place attempt an analysis; as, according to our plan, we give concise accounts of the more useful mineral bodies, in their alphabetical order.

Minium. See *Red* Lead, p. 76.

MINERAL WATERS, include all such fluids as are naturally impregnated with heterogeneous matter, which they have dissolved within the bowels of the earth, whether sulphureous, metallic, or saline; and, as many of these are successfully employed in medicine, they have received the appellation of *medicinal waters*.

Mineral waters have been divided into *hot* and *cold*, from their being either sensibly hotter or colder than the atmosphere. They have also been classed, according to their predominant ingredients, into *acidulous*, *alkaline*, *martial*, *sulphureous*, &c. It is not, however, our design to enter upon a minute investigation of their constituent parts; but, as the analysis of mineral springs may, to many inquisitive persons, afford a pleasing recreation, independently of its real utility, we shall subjoin a few rules necessary to be observed in making such experiments; together with a concise account of the waters of Acton, and Aix-la-Chapelle, referred to this article on former occasions.

I. All experiments ought to be conducted near the spring, if it be practicable.

II. The situation of such spring, the nature of the soil, and the contiguous rising grounds (if any occur) should be carefully examined.

III. With the view of analyzing the water, it will first be necessary to observe the changes it may spontaneously undergo, as well as the various parts, or matters, into which it may separate. For this purpose, it will be advisable to fill several shallow but large cylindrical glasses at the well, or spring, which should be immediately examined by the taste, eye, and smell: after which they ought to stand at rest for two, three, or more hours, or even as many days. At the end of this period, the investigation must be repeated; the fluid compared with water newly drawn from the spring; and, if any separation of parts take place, any scum arise, or sediment be formed at the bottom of the glass, they ought to be carefully collected for future examination.

IV. These glasses should next be deposited in a warm place; till, the watery parts being totally exhaled, a dry substance only remains; which ought to be compared with the sediment obtained from the same water by evaporation over the fire, in order that the real difference between both dry substances, may be more precisely ascertained.

V. It will next be requisite to analyze the water *chemically*: for this purpose, a certain portion of it ought to be taken from the spring, and poured into a retort with a wide neck, to which a clean glass receiver, well luted, should be affixed. The whole must now be placed over a moderate fire, so as to simmer the water till all the aqueous particles are *come over*; when the vessels should be suffered to cool, the distilled water carefully drawn off, and deposited in a well-closed glass: then the dry substance must be separated from the bottom of the retort, weighed, and likewise preserved in a glass.

VI. The distilled water must next be examined by various tests, to ascertain whether it materially differ from distilled common water; or whether it be impregnated with any saline or mineral particles, similar to those observed in the natural fluid, when first drawn from the well. In this process, if the water contain any common salt, it will, with a solution of silver, assume a white colour: if vitriol of iron be one of its ingredients, it will become black, on being mixed with pulverized galls.

VII. In case the water be suspected to contain any salts, it will be advisable gently to boil a quantity of the dry substance obtained by distillation, in five or six times its weight of pure common distilled water, such as is totally divested of all mineral particles. By this process, the saline matter will be dissolved or suspended in such water, in the form of a solution, which, on being filtred, and evaporated to dryness, will re-produce its salt. And, if there should be other salts in the same solution, they may all be obtained, by repeating the filtration and evaporation.

VIII. After the different salts are thus evolved, it will perhaps be attended with some difficulty to ascertain those species which are denominated *neutral*. This may be effected by observing the appearances assumed by such salts, on being mixed with other matters. Thus, marine or sea-salt may be known by the white vapour which it emits when in contact with oil of vitriol, and also by its taste, as well as by its cubical figure, on being crystallized. Another distinguishing characteristic of neutral salts is, their property of producing or regenerating sulphur, when mixed and liquefied with salt of tartar, and pulverized charcoal. If, therefore, two parts of such salt be mixed with one part of salt of tartar, and a similar portion of carbon in powder, and the whole be melted in a crucible, a reddish mass will be formed, possessing an alkaline sulphureous taste, and which will communicate a deep yellow or orange colour to rectified spirit of wine.

Lastly, if there remain any matter, after these various operations have been performed, it is generally denominated an *earth*, which, by repeated ablutions in pure distilled water, may be divided into various kinds of species, such as calcareous, siliceous, bolar, or ochreous, &c. These may be still farther examined by the test of fire; and, according to the appearances they assume, on being exposed to that element, it may be easily discovered whether they are *vitrescible*, or capable of being converted into glass; whether they will calcine, or become a species of lime; or, whether they will yield any metallic substance.—Such is the method by which the analysis of mineral waters ought to be conducted; and it is only by a strict observance of the rules above stated, that chemists have been enabled to enrich the world with numerous discoveries in the mineral kingdom.

Acton-water, is a mineral spring of that place, in the county of Middlesex. It is of a whitish colour and sweetish taste, accompanied with a mixture of the bitter found in the Epsom water. Its salt is not so soft as that obtained from the latter, though it is more pungent and nitrous, and strikes a deep red or purple, with the tincture of logwood in brandy. It is chiefly used on account of its purgative properties, being little inferior to the Epsom water, of which we have already given an account, vol. ii. p. 232.

Aix-la-Chapelle, or Aken water, takes its rise from several springs in the city of that name. It is remarkable for its sulphureous taste and smell, both which are, by drinking it, communicated to the body. This mineral spring is chiefly employed as a hot-bath; and, from its sulphureous properties, is particularly useful in all cutaneous affections; though, when taken internally, it is likewise of extensive utility, and possesses considerable medicinal powers. Its sensible effects, indeed, are not very remarkable. In general, it produces a slight degree of gaiety and cheerfulness; but, if drank in too large doses, is apt to produce nausea, vertigo, and sleepiness: if taken in moderation, it proves mildly laxative.

The waters of Aix-la-Chapelle are chiefly resorted to by those who complain of indigestion, and other affections of the stomach, arising from too luxurious living. They are, besides, very efficacious in rheumatism; in hysteric, nervous, and hypochondriacal cases; in melancholy; the stone and gravel; in paralysis; and a variety of other disorders.

The proper seasons for drinking these waters are, from the middle of May to the beginning of June; and from the middle of August to the latter end of September. In taking them internally, the patient should commence with half a pint for a dose, which ought to be increased and repeated more or less frequently, according to the effects it produces, and the intention with which it is used.

As mineral waters frequently contribute to the recovery of health; and as many persons are prevented from resorting to the place, whence such fluids are obtained, various experiments have been made, with the view of procuring them by art, and communicating to them all the properties of the natural waters. The most complete of such chemical processes appears to be that of M. GOLDSCHMID, who has established a manufactory of factitious waters, at Paris, in imitation of the natural springs of Seltz, Spa, and Sedlitz, which have in all respects been found equal, or superior to those celebrated wells. His preparations have undergone a rigid examination by the ablest chemists, both with respect to their physical properties, and the nature of the salts employed. According to the reports of BUILLON-LA-GRANGE, and CHAUSSIER, M. GOLDSCHMID's artificial waters are very clear and transparent, possessing a strong acid flavour, and communicating a deep red shade to the tincture of turnsol. On being placed in contact with various re-agents, these compounds, when mixed with lime-water, produced abundance of carbonate of lime; with caustic alkalies, neutral salts; and, when poured on the filings of the purest iron, they acquired, in a short time, a ferruginous taste.

With respect to the carbonic acid, or fixed air, it appears that the factitious waters contain of it *twice and a half of their volume*, which is considerably more than the natural springs.

The advantages of these ingenious preparations are stated to be, 1. That they are not liable to be affected by rainy weather, as is the case with the natural water, which is remarkably influenced by the season. 2. That they do not part with any gas and other volatile constituents, by conveyance, and by keeping them for some length of time; and 3. That the natural fluid can hold in solution only such a proportion of metallic ingredients as the acids and gases contained therein, are capable of dissolving; while the factitious mineral waters are not only cheaper and more efficacious, but retain their virtues without diminution, are impregnated with a larger volume of gas, and may be composed of any quantity and quality of salt or earth, according to particular circumstances. Lastly, they are far more convenient to the purchaser, being much stronger than the natural waters, so that there will be no occasion to drink such large and nauseating doses, as are usually taken of the latter.

With respect to the waters of Bath, Bristol, Buxton, &c. and the principal foreign *wells*, the reader will find a short account of them, in the progress of the alphabet.

MINT, or *Mentha*, L. a genus of plants comprising 24 species, 12 being natives of Britain; of which the following are the principal:

1. The *Pulegium*: See PENNYROYAL.

2. The *Arvensis*, or CORN-MINT; growing on moist heaths, pastures, and in sandy inundated fields; flowering from June to September.—It is eaten by horses, and goats, but disliked by sheep, and refused by hogs and cows; though the animals last mentioned devour it eagerly towards the end of the summer, when pressed by hunger, and the pastures are bare; in which case it prevents the coagulation of their milk, so that it is with the greatest difficulty converted into cheese.

3. The *viridis*, or SPEAR-MINT, which grows on the banks of rivers, and in watery situations; flowers in the months of July and August.—It is propagated by part-

ing the roots; and, as its flavour is more agreeable than that of most other species of this plant, it is generally preferred for culinary purposes.—The leaves of the Spearmint, when prepared with sugar, form a delicious conserve; and the distilled waters, both spirituous and simple, are highly esteemed for their mildness and pleasant taste. —The leaves are eaten in the spring as a salad; and their juice, when boiled with sugar, is formed into lozenges.

4. The *piperita*, or PEPPERMINT, growing in watery places, and on the banks of rivulets; flowering in the months of August and September.—Its stem and leaves abound with minute vesicles containing a very pungent essential oil, that rises in distillation.—This species is the strongest and most aromatic of the mints, on which account it is alone used in medicine, and the liquor prepared from it, is known under the name of *Peppermint-water*.—Being an excellent stomachic, it is but too often used in cases of impaired appetite, flatulence, colics, nausea, and inclination to vomit. It has also occasionally been found of service in hysteric affections; and, however harmless in itself, when considered as a *simple* water, this *exhilarating carminative* is so far a dangerous domestic medicine, as with many nervous and irritable persons, it is apt to introduce a habit of *tasting* the stronger spirituous liquors.

MIRROR. See LOOKING-GLASS.

MISER. See AVARICE.

MISSELTOE, the COMMON, White Misseltoe, or Missel; *Viscum album*, L. a parasitical plant growing on Apple and Pear-trees, the Hawthorn, Service, Oak, Maple, &c.; flowering in the month of May.

From the berries, as well as the bark of this plant, good bird-lime may be prepared; and, if the former be rubbed, when fully ripe, on the bark of almost any tree, they will adhere closely, and produce plants in the succeeding winter.

Fieldfares and thrushes eat the Misseltoe berries, the seeds of which pass through them unchanged, and along with their excrements adhere to the branches of trees, where they vegetate.—No art has yet induced the Misseltoe to take root in the earth.—Sheep eagerly devour this plant, which is frequently cut off the trees for them, during severe winters; nay, it is even said to preserve these animals from the *rot*.

Professor BOCK, in his *Natural History of Prussia* (vol. iii. p. 367, Germ. edit.), informs us, that poor people have often, in times of scarcity, collected and dried the stalks and branches of the Misseltoe; then pulverized and mixed them with rye-flour; and thus obtained nourishing bread, which was by no means unwholesome.—Professor LEONHARDI, in a similar work, observes that the Misseltoe, or bird-lime, when combined with soap-boilers' suds, affords a good substitute for soap, and is alike soluble in water and spirit of wine.

MIST. See FOG.

MITE, or *Acarus*, L. a genus of insects, consisting of 35 species, the principal of which is the *Asiro*, COMMON, or CHEESE-MITE. It is very small, and when first hatched, is so extremely minute as to be scarcely perceptible by the naked eye. Though principally infesting cheese, there are several varieties of this species, breeding in flour, meal, &c. and occasioning considerable injury. The most effectual method of expelling these noxious vermin is, according to Leeuwenhoek (who was indefatigably attentive to their generation and growth), to place a few nutmegs in the sack, or bin containing the flour; as the odour of that spice is insupportable to mites; which will thus be removed, without the meal acquiring any unpleasant flavour.—Funke advises a cheaper remedy, consisting in the decorticated thick branches of the lilac or elder-trees, which are to be put in the flour, and will answer both as a preventive, and for their expulsion.

There are other species of mites, that breed in animals when unclean or filthy, especially in dogs, cows, &c. nay, even on insects.—Nor is the human body exempt from their invasion, particularly when infected with the itch (or other eruptive disease), of which they are by many considered as the cause; mites having been frequently found in the watery pustules which occasion that peculiar itching sensation. In dysentery, also, these vermin have been ejected with the feces; whence it is evident that they live and prey on the interior parts of the system.

Mithridate. See Venice Treacle.

MITHRIDATE-MUSTARD, or Bastard-cress, *Thlaspi*, L. a genus of plants comprising fourteen species, six of which are natives of Britain: the principal of these is the *arvense*, Smooth Mithridate-Mustard, Treacle-Mustard, or Penny-cress. It grows in corn-fields, especially in muddy soils, and flowers in the months of June and July.

The whole plant has the flavour of garlic; and its seeds possess the acrimony of mustard. It is, nevertheless, eaten by goats, hogs, and cows, to the milk of which it imparts an unpleasant taste; but is refused by horses and sheep.

MOFFAT-WATERS, are those sulphureous springs which issue from a rock, in the vicinity of the village of Moffat, North-Britain.—The smell of this water corresponds with that of Harrogate; its taste is saline and sulphureous, divested of all bitterness.—It is chiefly employed in cutaneous and scrophulous cases; but has been found very beneficial, when applied externally, to irritable and ill-conditioned ulcers.

The Moffat-waters have lately been of considerable service to persons afflicted with calculous and biliary complaints; in cases of indigestion; and for invigorating the alimentary canal, where general weakness and inactivity prevail.

The dose varies according to the constitution of the patient; but, as this water may be safely drunk at almost every season, it ought to be taken liberally, in such quantities, and at such intervals, as the persons affected can conveniently bear. From one to three bottles should be taken every morning; a quantity which produces scarcely any other sensible effects, excepting an increased flow of urine.

MOISTURE denotes a property peculiar to certain bodies that absorb humidity from the atmosphere; such are, sugar, salt, sponge, &c. but which again exhale the watery particles, when exposed to a drier air, or a warmer temperature.

The moisture of the air has a considerable effect on the human frame. Thus, if the quantity and quality of the food, together with the proportion of meat and drink, be ascertained, the weight of the body will be less, and the discharges will consequently be greater, during dry than in wet weather; because the humidity of the air communicates itself to the fibres of the skin; and, by lessening their vibratory motion, diminishes the insensible perspiration.

A patent was granted, in 1795, to Mr. JAMES WILLSON, for his invention of a mode of preventing, in a very material degree, the effects of moisture on the human body; and of facilitating relief in inflammatory and spasmodic complaints, arising from humidity, as well as from other causes.—The inventor's contrivances are ingenious; but, as they would be unintelligible without a plate, and as his privilege is not expired, the curious reader will consult the 12th vol. of the *Repertory of Arts*, &c. where a full specification is given, and illustrated with an engraving.

MOLASSES, or MELASSES, the gross fluid matter, which remains after refining sugar; and which cannot by simple boiling be reduced to a more solid consistence than that of common syrup, vulgarly called *treacle*.

In Holland, this article is chiefly used in the manufacture of tobacco, and by the poor people as a substitute for sugar. A kind of brandy is prepared from it in this country, in considerable quantities, by dissolving a certain portion of molasses in water; fermenting it with wine-lees; and distilling the whole over a moderate fire. This spirit is, however, generally adulterated in such a manner as to render it extremely pernicious to the consumer; but as it tinges the hands, or any substance immersed in it, of a fine yellow colour, it may, we conceive, be more advantageously converted to the purposes of dyeing.

Molasses likewise form a wholesome and agreeable beverage, when prepared as a kind of BEER, of which we have already given an account, p. 237 of our first vol.—Farther, this thick fluid may be divested of its mawkish taste, and thus rendered fit to be used as a substitute for sugar. We select the following process from CRELL's *Chemical Annals* (vol. i. part 2. 1798, in German), published from the experiments originally made by M. LOWITZ:—Let 24lbs. of molasses, a similar quantity of water, and six pounds of charcoal coarsely pulverized, be mixed in a kettle, and the whole boiled over a slow fire. When the mixture has simmered for the space of half an hour, it must be decanted into a deep vessel, that the charcoal may subside; after which the liquid should be poured off, and again placed over the fire, that the superfluous water may evaporate, and restore the syrup to its former consistence.—Twenty-four pounds of molasses thus refined, will produce an equal quantity of syrup.

This method has been successfully practised on a large scale, in Germany; and, we conceive it might be advantageously imitated; for the molasses thus become sensibly milder, and may consequently be employed in various articles of food. For dishes, however, in which milk is an ingredient, or for cordials which are to be mixed with spices, it will be preferable to make use of sugar.

MOLE, or *Talpa*, L. a genus of quadrupeds, consisting of seven species, of which the *Europaeus*, or European Mole, only is found in Britain. It abounds in all parts of Europe, excepting Ireland.

This animal is from five to six inches in length: its head is large, without any external ears, and its eyes are so very minute, and concealed in the fur, that it is vulgarly believed to be blind.

The Mole chiefly frequents meadows, gardens, and moist fields that are exposed to the sun, especially on the approach of rain; when it does considerable damage, by loosening the fibres and roots of vegetables, while constructing its subterraneous abode.—The female produces from four to six young at a time, which are deposited in nests, artfully made with moss, leaves, and dried grass, beneath the largest hillocks of the field. These dwellings are formed with admirable ingenuity, consisting of an interior hillock, surrounded with a ditch, that communicates with several streets, bye-ways, and galleries.

Various means have been contrived for extirpating *moles*, such as irrigating the fields infested with them, &c.; but the most effectual is that described by Dr. Darwin, in his *Phytologia*, and derived from the experience of a successful mole-catcher.—This man commenced his operations before the rising of the sun, when he carefully watched their situation; and, frequently observing the motion of the earth above their walks, he struck a spade into the ground behind them, cut off their retreat, and dug them up.

As moles usually place their nests much deeper in the ground than their common habitations are situated, and thus produce an elevation, or a *mole-hill*, the next step is to demolish such nests by the spade; after which the frequented paths must be distinguished from the bye-roads, for the purpose of setting subterraneous traps. This will be effected by marking every *new* mole-hill with a slight pressure of the foot, and observing the next day, whether a mole has passed over it, and effaced such mark; which operation must be repeated two or three mornings in succession, but without making an impression so deep as to alarm and induce the animal to open another passage.

The traps must now be set in the frequented paths, and ought to consist of a hollow wooden semi-cylinder, each end of which should be furnished with grooved rings, containing two nooses of horse-hair, that are fastened loosely in the centre, by means of a peg, and are stretched above the surface of the ground, by a bent stick or strong hoop. As soon as the mole passes half way through one of these nooses, and removes the central peg in his course, the curved stick rises in consequence of its elasticity, and thus strangles the animal.

The method above detailed being ingenious, it deserves to be generally adopted; as those, whose grounds are infested with moles, may easily extirpate them, or teach the art to their labourers.—It is, however, in our opinion, an undecided point, whether these little quadrupeds, that live entirely on worms and insects, of which they consume incalculable numbers, are not to be considered as harmless, nay, useful rather than noxious; especially as they have their formidable *natural* enemies in foxes, martins, weasels, hedge-hogs, serpents, and cats. Farther, it has been observed, that fields and gardens, where all the moles had been caught, abounded with vermin and insects. But, if these burrowing creatures become too numerous and hurtful to the vegetation of plants, or dangerous to dykes and banks, the most easy method of destroying them is, to expose a few living lobsters in a deep-glazed earthen vessel, the top of which is somewhat narrower than its basis, so that they cannot escape: such a pot must be buried several inches deep in the ground, and covered with green sods, so as to be accessible to the mole, which is remarkably partial to that shell-fish. No sooner has one of the former entered the pot, than others from the vicinity will hasten to the fatal receptacle, in consequence of the noise made by the captive; and thus meet with inevitable destruction.

MOLE-CRICKET, or *Gryllus gryllo-talpa*, L. a destructive insect, in the vicinity of rivers, infesting moist meadows, and gardens, in which it does great injury to the plants and roots; destroying whole beds of cabbages, flowers, &c. It is produced from an egg, and furnished with wings similar to those of the common cricket, together with a pair of fore-feet resembling those of a mole, and with which it works its way beneath the soil, raising up ridges in its subterraneous progress, and defacing the beauty of garden-walks.—No method has hitherto been discovered of preventing the depredations of these pernicious vermin. But, as the generality of crickets are particularly averse to the fetid exhalations of hogs'-dung, it is highly probable that the *mole-cricket* may be expelled, though not extirpated, by spreading this kind of manure upon infested lands.

MOLE-PLOUGH. See DRAINING, vol. ii. p. 159.

MOLTEN-GREASE, a disorder in horses, consisting of a fat or oily discharge with the fæces: it arises from a colliquation or melting down of the animal's fat, in consequence of violent exercise in very hot weather.

This disease is always attended with fever, heat, restlessness, starting and tremblings, great sickness, shortness of breath, and sometimes with inflammatory symptoms. The horse rapidly becomes lean, and, if it survive this attack, commonly grows hide-bound; his legs swell, and continue in that state, till the humours are in a more natural condition; but, if the disorder be neglected, the farcy, or an obstinate surfeit, generally succeeds, and which is with difficulty removed.

The first step towards effecting a cure of this malady, ought to be profuse blood-letting; an operation which should be repeated, though in smaller quantities, for two or three successive days. Immediately after these evacuations, two or three rowels should be introduced, with a view to promote a large drain; while cooling emollient clysters are administered, to abate the fever. The drink should consist of warm water or gruel, with cream of tartar, or nitre, in order to dilute or attenuate the blood; which, in this case, is greatly disposed to become clotted, and to engender a total stagnation of the fluids.

When the fever has abated, and the horse has recovered his appetite, the following mild purgative should be given once a week, for some time, till the disorder be entirely removed: Take of Socotrine aloes 6 drams, of pulverized gum guaiacum ½ an ounce, of diaphoretic antimony and powder of myrrh, each 2 drams; form the whole into a ball with syrup of buckthorn. While this medicine is operating, the horse's labour should be suspended for two or three days every week: thus, he will lose neither his flesh nor appetite, but improve in both; because this ball is, on the whole, preferable to any other preparation for that purpose.

MOLYBDŒNA, a mineral that is frequently confounded with *black-lead*; though possessing properties widely different from the latter.—It is of a laminated texture, or formed of plates which slightly cohere; are somewhat greasy to the touch, and soil the fingers; leaving, on paper, marks or traces of a dark-grey colour.

This metal has, hitherto, been found only in Sweden, Germany, Carniola, and the Alps. It is of a light lead-grey shade, sometimes shaded with red, or streaked with a blueish grey. It is insoluble in the sulphuric and muriatic acids; though, in a boiling heat, it tinges them green; effervesces with warm nitric acid, leaving a grey oxyd or powder undissolved; and also with soda, to which it imparts a reddish pearl-colour.

Molybdœna is at present extremely scarce; but, should it ever be found in abundance, it will certainly be of great utility both for dyeing and painting. If one ounce of the perfect oxyd of molybdœna, be boiled with sixteen ounces of water, till the liquor is reduced to one-third; then filtred, and half an ounce of it poured into a small glass vessel, containing ten grains of tin-filings; and next, if four drops of the muriatic acid be added to this mixture, and the whole be suffered to stand at rest, a fine blue colour will be speedily produced, which rises from the bottom; gradually acquires a deeper shade; and is, at length, deposited in the form of a blue powder.

A beautiful *blue lake* may likewise be obtained, by precipitating the solution of muriat of tin, by means of dissolved molybdat of pot-ash, if both solutions be previously diluted with a considerable proportion of distilled water.—This precipitate is called by Richter *blue carmine*; and, we conceive, might be of eminent service to portrait-painters.

Monarda. See Spice.

MONEY, a piece of metal, which by public authority bears a certain weight and value, so that it may serve as a circulating medium in commerce.

Money is, in general, divided into two kinds, viz. *imaginary*, or money of account; and *real*, or effective. The former class includes such as never was coined in *specie*; and, though a certain term for expressing it has been invented or retained in different countries, with a view to facilitate the stating of accounts, by keeping them on an uniform basis, yet this ideal money is not liable to be changed in the same manner as current coins, which are raised, or lowered, as the exigencies of the State may require. Of this nature, for instance, is the *Pound Sterling*, as well as the nominal money of other countries.

Real money comprehends all coins or species of gold, silver, copper, &c. which do exist, and are commonly current. Such are guineas, half-guineas, seven shilling pieces; crowns, half-crowns, shillings, six-pences; two-penny and penny pieces; half-pence, and farthings.

As money is the common measure of every kind of commodities, the fabricating of *base coin* has at all times, and in every State, been considered as treasonable. Hence, to preserve public faith, the law of England considers not only the coining, but also the uttering of money or notes (knowing them to be forged) as felony without benefit of clergy. These penalties are certainly dictated by the soundest policy; but, so long as the *Bank of England notes* are formed on a principle capable of being imitated by perverse ingenuity, we fear the wisdom of the legislature will be ineffectual; and the number of those, who are annually sacrificed to the offended laws of their country for this crime, far from being diminished, will probably continue to increase.

MOON, in astronomy, one of the heavenly bodies, usually, though erroneously, classed among the planets; for it is with more propriety considered as a satellite, or secondary planet.

The mean distance of the moon from the earth, is computed by astronomers, to be about 240,000 miles: her diameter is as 100 to 365, that is, about 2180 miles.

The moon appears to us under various forms; being sometimes horned, at others semi-circular; then full and round. Sometimes this celestial body increases; at others, it is on the wane; illumining the globe, we inhabit, at certain periods throughout the whole night, at others only for a few hours.—The cause of these appearances is believed to arise from the moon being an opaque dark body, which shines only with the light she receives from the sun; hence only the part turned towards that luminary can be illuminated, and consequently transmit light; as the other side is involved in its native darkness. These phenomena, however, it is not within our province to explain; and, as the inquisitive reader will doubtless consult the profound writings of MASKELYNE, HERSCHEL, and other astronomers, who have devoted their sleepless nights to the observation of this satellite, we shall not enter into any farther details.—See also ASTRONOMY.

Formerly, the moon was believed to possess considerable influence on the human body; but such opinion, though sanctioned by the name of MEAD, and other eminent physicians, is now generally exploded. This luminary, however, greatly influences the vegetable creation, and likewise appears to affect quadrupeds, especially horses. It is well known, that these useful animals are subject to a weakness of the eyes (particularly when they are somewhat advanced in years); and that such debility increases, or decreases, according to the course of the moon; whence they are said to have *moon-eyes*. Thus, in the wane, they are dull and muddy, or troubled; but, on the approach of the new moon, they re-assume their former lustre.—No remedy has hitherto been discovered for this affection, which generally terminates in total blindness.

MOOR, or Moor-land, a black, light, soft soil, remarkably loose, without any admixture of stones, and containing a very small proportion of clay, or sand.

This earth usually forms the uppermost stratum of fen-lands, and consists almost wholly of pure vegetable matter, which renders it very fertile. Moors, however, are subject to inundations, and they retain moisture for a considerable time, so as to render it difficult for cattle to graze, without poaching the soil. To remedy this inconvenience, the tenants of such lands pare and burn them at certain seasons of the year; by which process their nature is considerably improved, as the surface readily takes fire, and burns freely.

In other respects, the conversion of moors into arable or pasture land, varies little from the method already stated under the article Marsh; provided such tracts of ground be in a plain, or on a level. It will be advisable, however, to plant the black willow preferably to any other tree or shrub; as it flourishes well on moors, and affords an excellent shelter to cattle during stormy weather. The course of crops that has been found most profitable, is, for the first three years, grass; that is, hay-seeds, and the different kinds of clover, sown after the surface has been burnt and ploughed in: during the next three years, two crops of corn, with an intermediate fallow. By such rotation, lands that were naturally of little value, have been rendered fit to produce very beneficial crops.

But, where moors occur in mountainous situations, Mr. Young recommends them first to be drained and irrigated, as the water will work numerous passages round the heath, that is usually found in moor-lands; but which will speedily perish when flooded, and will be succeeded by sweet grasses, and other useful plants.

The next step will be to inclose the land with a double, dry stone-wall, between which young oaks, alders, ash, holly, mountain-ash, &c. may be advantageously planted; for, independently of the immediate shelter thus afforded to cattle, they will, in the course of a few years, become very profitable woods. In some cases, a simple inclosure has, without farther cultivation, been found very beneficial for feeding the common Scotch wethers, which are distinguished by black faces and legs, and long coarse wool.—Mr. Young observes, that mountainous moors, if tolerably well covered with heath, intermixed with spots of sedge, rushes, and coarse grass, will support a sheep on an acre, throughout the year; and, as the rot seldom occurs on these lands, it has been found, that flocks pastured on them, without the addition of hay, thrive well, and oftentimes better than those which are regularly foddered. If, however, the design be to establish a grass-farm, it will be advisable to pare, burn, and *lime* the lands, after which they must be once thinly ploughed, that the lime and ashes may not be too deeply buried.

As the cultivation of mountainous moors is either productive of great profit, or of total ruin, the greatest judgment is requisite in fixing the course of crops. The chief object being to convert these soils ultimately into good meadows, or sheep-walks, the tillage ought only to extend to the destruction of spontaneous growth; to the removal of the acidity peculiar to peat-soils, and to support a flock during the winter: which purposes may be effected by paring and liming judiciously, and also by sowing hay.—The first course, which Mr. YOUNG considers as deserving more particular attention, is:

1. Turnips, or cabbages.
2. Oats.
3. Grasses, *mown*.
4. &c. Grasses, *fed*.

This course is generally preferable to others; but, in case it should be found inadequate, he recommends the following variation to be adopted, viz.

1. Turnips or cabbages.
2. Cabbages or turnips.
3. Oats.
4. Grasses, mown.
5. Grasses, fed.

Such rotation is, in Mr. YOUNG's opinion, far superior to that in which turnips, &c. and oats, are sown twice alternately, previously to laying down grass-seeds; because the grass is thus defended one year; whereas two alternate crops of oats too much exhaust the virtues of the manure, before the grass-seeds are sown; while the turnips, &c. being fed on the land, return to it, by the dung of the cattle, comparatively more than they derive or take from it.

As there are extensive wastes in various parts of England, which consist of moors, capable of being brought into a high degree of cultivation, the patriotic Society for the Encouragement of Arts, &c. has, from time to time, offered premiums for improving them.—Large tracts of lands have, in consequence, been rescued from a state of nature; but the most considerable improvement appears to be that effected by JOHN MIREHOUSE, Esq. of Brownslade, Pembrokeshire, on whom the Society, in 1800, conferred their gold medal; and whose merit we have incidentally mentioned, under the article DRAINING.

The quantity of land thus recovered, was 274 acres, situated between two hills, which extended nearly two miles in length: it was formerly a common, so completely inundated as to be of little or no value. The lord of the manor having obtained an act of parliament for its inclosure, Mr. MIREHOUSE proposed to take a lease, on condition that the proprietor should cut a drain, and lay down a tunnel; which being accordingly executed, the lease was concluded, and Mr. MIREHOUSE proceeded to complete the drainage.

He formed a channel on the north side, and divided the land into twelve pieces, by double ditches, of such a depth as the fall would allow, from a few inches to four feet: between the ditches, a space of about 30 or 40 feet was left for planting willows. The soil appeared a perfect sponge; and, as soon as the drains began to take effect, it sank so considerably that, after frequently lowering the ditches, the surface of the water remained nearly the same distance from that of the land. Having repeatedly sunk the principal drains and ditches, he at length obtained above three feet from the water to the surface of the land, *in the lowest parts*; and, in others, a level sufficient for his purpose.

The common being thus inclosed and divided, Mr. MIREHOUSE commenced the draining of each division, by small internal cuts, about 20 inches wide at the top, and of various depths, to three feet and a half, reducing them to six inches at the bottom; leaving those open which were in the direction of the plough, and filling up others with brush-wood. Both these drains answer to his entire satisfaction; and he observes that the whole common has been converted from a state of waste into excellent land, for the sum of 508l.

We regret that our limits do not allow us to detail the course of crops pursued by this truly "Practical Agriculturist:" let it therefore suffice, to conclude, that barley and oats have seldom succeeded; but the wheat raised on this land, has been very abundant, and the grain weighty: cole-seed has also been cultivated with great advantage, as a winter food, the crops having in general been very fine, and enabled Mr. MIREHOUSE to feed great numbers of sheep during the space of four months, from January to April; and to fatten them much sooner than he had ever been able to effect, on turnips of the best quality, produced on his *home-grounds*. In short, the land, from being of no value, has already been very productive; and Mr. MIREHOUSE thinks it will, in a short time, become the most valuable meadow of the neighbourhood. The vegetable substance thus drained, has become a fine luxuriant black mould, to the very surface of the water, and is daily losing its sponginess, and acquiring greater cohesion.

MORDANTS, or MORDICANTS, in dyeing, signify those substances, which are employed for the purpose of macerating the stuffs, and rendering them capable of imbibing the tinging matter. Of this nature are, the sulphat of alumine; the acidulous tartrite of pot-ash; the solution of tin in nitro-muriatic, and oxygenated muriatic acids; the vegetable astringent principle, or gallic acid; acetite of alumine; sulphat of copper, or blue vitriol; arsenic; acetite of copper, or verdigrease; and the sulphat of zinc, or white vitriol.

Mordicants act on stuffs in two different ways: 1. By parting with a portion of their oxygen, in consequence of which the substance of such stuffs is changed, and their attraction for the pigment or colouring matter is increased; and, 2. By altering, in a similar manner, the nature of the pigment, and rendering it capable of coagulation. Thus, the colouring matter undergoes several changes, and receives various degrees of a lighter or darker shade.

It would exceed our limits, to point out the different mordicants, which are adapted to certain colours, or to particular stuffs; for these can be only ascertained by experience. But, as the fine Turkey *red* communicated to cotton by means of madder, depends principally on the mordants employed in that process; and, as the knowledge of these is involved in considerable obscurity, by the jealousy or avarice of dyers, we shall subjoin a few hints on their effects in dyeing cotton red, selected from the memoir lately published by M.

Chaptal, in the "*Annales de Chimie.*"

The three principal mordants used in this operation are, oil, galls, and alum.

The greatest caution is necessary in choosing the *oil,* which ought to be similar to that employed in painting, and to contain a large portion of the *extractive principle.* Hence, this oil should not be completely saturated with the alkali; but, previously to giving the red dye to the stuff, it ought to be combined with a weak solution of soda (or of pot-ash, if the former alkali cannot be easily procured); and the cotton duly impregnated with this preparation; by which every part of it will thoroughly imbibe the oil. The next process is that of *galling,* for which purpose, galls only should be employed, as no other vegetable astringent is equally efficacious.

The last mordicant is *alum,* which not only possesses the property of brightening the red tint produced by madder, but at the same time contributes, by its decomposition, and the fixity of its earth or aluminous base, to give solidity to the colour. In order to judge of its effects in dyeing cotton, it will be sufficient to mix a decoction of galls with a solution of alum. The mixture will immediately become turbid, and a greyish precipitate be formed, which, on being dried, is insoluble both in water and in alkaline ley. Great care, however, is requisite, that the aluminous solution be not *too hot,* lest part of the astringent principle, obtained from the galls, escape from the cotton, and the alum be decomposed in the immersion; a circumstance by which the power of the mordant is necessarily diminished, and the colour is impaired.

It is, therefore, to be attributed wholly to the *united effects* of the three principles (oil, the astringent principle, and the earth, or base of alum), which serve as a mordant in dyeing red with madder. If these be employed separately, they will neither produce the same fixity, nor afford a similar brilliancy of colour.

Morning. See Day.

MOROCCO-LEATHER, the skins of goats tanned and dyed in a peculiar manner by the Turks; but which processes were originally invented in the kingdom of Morocco.

The skins are prepared in parcels, consisting of 36, divided into six bundles, which are folded in the middle, lengthwise, and thrown into a pit full of lime, whence they are taken out, rinsed in pure water, drained, and suspended in the shade to dry, till the hair becomes loose. After carefully taking off the latter, the skins are returned to the lime-pit, for two or three weeks, when they are again rinsed, and passed repeatedly through a decoction prepared of 30lbs. of dog's-dung, and an equal quantity of water. As soon as the skins are thus gradually impregnated, they are thrown into a large vessel for the space of twelve hours, after which they are cleaned with pure water, and immersed for seven or eight days in a watery decoction made of bran.

The skins are now wrung, and thoroughly washed in clear water, to render them soft and pliable: next, they are cured, by spreading a thick layer of common sea-salt, in the proportion of about half a pound to each skin, and piling them up, till they are rendered sufficiently supple. The last process which the skins undergo previously to being dyed, is immersion in a liquor prepared by boiling 24 ounces of dried figs, for each skin, in a copper (we believe, treacle would answer the same purpose), in which they remain till they are about to be suspended in the air for drying: lastly, they are dipped in a solution of alum, that disposes them for the immediate reception of the dye.

The chief colours communicated to Morocco-leather, are *red* and *yellow*, for the preparation of which, the Turks have long been celebrated.

The *red* colour is prepared by mixing together various articles, in the following proportions, which are required for a parcel of 36 skins:

	Drams.
Cochineal - -	130
Round suchet (crocus indicus)	45
Gutta gamba - -	15
Gum-arabic - -	10
White alum, pulverized -	10
Bark of the pomegranate-tree	10
Citron juice - - -	2
Common water -	120lbs.

The alum is gradually added to the other articles, which are thrown into a copper, where they should be boiled for about two hours, till one-tenth part of the water be consumed. In this mixture the skins are repeatedly immersed; and, when sufficiently imbued with the colour, they are dried, and again steeped in a vessel, containing three pounds of hot water (for every two skins) together with one pound of sumach, and a similar quantity of gall-nuts, pulverized and sifted.—As soon as the skins are completely impregnated with this liquor, they are slightly rubbed over with a sponge dipped in pure water, and suspended, without being folded, on a wooden frame, for about three quarters of an hour, to drain. They are now carried to a river, or running water, where they are repeatedly rinsed, then pressed with weights, in order to extract the moisture, and hung up in a warm room to dry.—The last process which red Morocco-leather undergoes, is that of polishing: this is effected by means of various wooden instruments, that contribute at the same time to remove such of the particles of gall and sumach as may adhere to the skins.

The *yellow* colour is prepared in a manner nearly similar to that just described; the common Avignon or yellow berries *(Graine d'Avignon)* being substituted for cochineal, and employed in similar proportions.

The only variation between the two processes of dyeing *red* and *yellow*, is, that the former is tinged with the colouring matter, before it is *worked*, or polished with the wooden instruments; whereas this operation is performed on the latter, previously to its being dyed.—But these two are not the only colours dyed by the Turks, who likewise manufacture black, green, and blue leather; which last three, however, are not only destitute of lustre, but are extremely perishable. The Turks, indeed, are as inferior to Europeans in preparing the more common species, as they excel them in manufacturing and dyeing the red and yellow moroccos.

MORTAR, a preparation of lime and sand, mixed with water: it serves as a cement, and is employed ed by masons and bricklayers in erecting walls, houses, &c.

Mortar being an article of extensive utility, it becomes an object of considerable importance to discover such a method of preparing it, together with such materials, as will perfectly cohere, and at the same time resist the action of the weather.

Having already treated, at some length, on this subject, under the head of CEMENT, we shall at present state two of the most simple methods of preparing strong and durable mortar.

The proportions of *lime* and *sand* usually employed in making the common mortar, are *two* parts of the former to *three* of the latter, which are mixed up with soft water; but its quality and durability will, according to Dr. ANDERSON, be considerably improved, if the lime be slaked, and the sand mixed up with *lime-water*, instead of the common. The reason assigned for this opinion is, that the fluid drawn from wells contains a large portion of fixed air; which, by mingling with the mortar before it is used, reduces the quick-lime into a kind of inert calcareous earth, similar to chalk, and thus spoils the cement. But, if the mortar be worked up in a perfectly caustic state, it attracts the air so slowly, that it concretes into a kind of stony matter, which, in the course of time, becomes as hard as the rock from which the lime-stone was taken.

In the year 1777 was published (in French), an ingenious "*Inquiry concerning the Manner in which the Romans prepared the Lime they used in Building; as also on their method of mixing and using their Mortar*;" by M. DE LAFAYE.—The principal circumstance appears to be the mode of slaking the lime without liquefying it, so as to reduce it to powder; and at the same time to leave it sufficiently caustic to yield a strong mortar; which, in proportion to its age, will acquire additional strength.—To effect such object, it is requisite to select good fresh lime, made of hard lime-stone, which is to be broken into pieces of the size of an egg. These should be placed in a shallow open basket, which ought to be plunged into water, till the surface of the fluid begin to boil. The basket is then drawn out, and suffered to drain for a short time; after which the lime is put into casks, where it speedily grows hot, and crumbles into powder.

The lime thus prepared, is to be mixed with various compositions of mortar, according to the purposes for which they are designed. It may be preserved for a considerable time, and will retain its useful properties, by simply covering the casks with straw.—M. GUYTON states, in a late volume of the *Annales de Chimie*, that he employed this lime, 18 years since, in the construction of a small aqueduct, which was intended to convey water to an artificial nitre-bed. The mortar consisted of equal parts of the following three ingredients, namely, sand, fragments of calcareous stone, and lime slaked according to the directions above given: in a short time, it acquired an uncommon degree of firmness, which has remained unimpaired since that period.—See also BUILDING, vol. i. p. 382.

MORTIFICATION, or *Sphacelus*, in the animal economy, is generally defined to be a total extinction of the natural heat of the body, or rather of a particular part, in consequence of inflammation.

Under the article Gangrene, we have already given some hints respecting the nature and treatment of this dangerous affection, so that we shall at present only add a few supplementary observations.

Mortifications of the external parts, such as the legs and feet, more frequently occur in debilitated persons, and those who are addicted to the use of spirituous liquors; or in the aged, gouty, scorbutic, &c. than in the young and robust.

Beside the means suggested for the removal of this complaint, vol. ii. p. 361-2, there are *three* other remedies, which have frequently proved successful:

Carminati recommends the external application of the *gastric juice* of animals to the parts affected, in a manner similar to that described vol. i. pp. 429-30.

The late Mr. Pott, after having experienced the inefficacy of the Peruvian bark in the cure of mortifications, accidentally discovered that *opium*, taken in pretty large doses (one grain every three or four hours), first procured a remission from the great and continual pain which the patient felt in his foot and ancle; and then stopped the progress of the disease; but Mr. Pott carefully watched the narcotic effects of this drug; keeping the body open by laxative injections. Thus, the mortified parts were cast off, the bones separated, and a clean sore was produced: while this was healing, the dose of the opiate was gradually diminished, and at length totally relinquished.

The last, and probably most effectual, remedy against this fatal disorder, appears to be the application of *fixed air*, whether by means of filling large bladders, or other vessels, in which the affected limb may be confined; or by the repeated use of *fermenting poultices*.—In the 3d vol. of the *London Medical Transactions*, Mr. John Power communicates a case, in which all the toes had perished, and the middle of the foot had mortified; but a cataplasm of wheat flour and honey, fermented by the addition of yeast, completely stopped the progress; healed the sore; and the patient, aged 67, recovered her health and spirits.

MOSCHATEL, the Tuberous, or *Adoxa Moschatellina*, L. an indigenous perennial plant, growing in damp woods, and shady places, where it flowers in the months of April and May.—The ripe fruit of this low plant has the flavour of strawberries. The plant itself possesses the odour of musk, for which it may serve as a substitute in chests, or drawers, among clothes. Its root was formerly in repute among the vulnerary herbs.

MOSS, in *Botany*, a term for a numerous family of plants, which may be called the dwarfs of the vegetable kingdom.

Mosses were formerly supposed to be a mere excrescence from the earth and trees, yet they are no less perfect plants than those of greater magnitude, having roots, flowers, and seeds, though no art has hitherto been discovered, to propagate them from the seed.

They are spread over the whole globe, so that in some situations the soil is exclusively covered by mosses; and thus frequently bare rocks gradually become fertile.—As they grow most copiously on the north-west side of trees, it is probable that mosses serve to protect them from the severity of cold; but, if these parasitical plants be suffered to increase too abundantly, they not only tend materially to injure trees, but also to stifle the more useful vegetables of the soil.

Mosses are almost constantly green; have the finest verdure in autumn; and, though kept in a dry place for a whole century, they may be revived, and their colour restored, by immersing them in water.

Dry moss is the most proper substance for mattresses, and greatly superior to straw; as it is not liable to be infested with mice, bugs, fleas, &c. When such couches become hard by compression, they may be easily raised again and rendered soft, by beating them with sticks. For this purpose, however, the longest and softest mosses ought to be collected, in September, during dry weather; then cleansed from all impurities and woody roots; dried in the shade; and again agitated with a stick, on a hurdle. Next, the mattress is to be stuffed eight inches thick, and quilted in the usual manner.—Nor is this soft substance less useful for packing glass, earthen ware, and other brittle articles, in preference to straw, or wood shavings.

Among the numerous *mosses* which are subservient to economical purposes, we shall at present only mention a few of the most useful; because others are inserted in their alphabetical place.

1. *Fontinalis antipyretica*, or Greater Water-moss, which grows upon rocks and roots of trees; in brooks, rivulets, slow streams, and ponds: it flowers from June to September.—According to Linnæus, this species resists the action of fire; and, if mixed with mortar for lining the inside of chimnies, it renders them *fire-proof*; as, contrary to the nature of all other mosses, it is almost incombustible.—Böhmer also remarks, that a thatched roof, if covered an inch thick with the greater water-moss, will be completely secured against fire.

2. *Bryum rurale*, which grows on roofs, both thatched and tiled; walls; and trunks of trees: it is perennial, and flowers from December to April.—Thatched buildings overgrown with this moss, instead of lasting about ten years, will remain sound for a century.

3. *Sphagnum palustre*, or Grey Bog-moss, which is also perennial, and flowers in July and August.—This species materially contributes to the production of peat or *turf*; so that in process of time, bogs and morasses are converted into beautiful meadows:—in Norway, it is employed for filling up the crevices of planks in wooden walls; and, though it be sometimes used for a similar purpose in tiled roofs, yet as it affords shelter to vermin, we conceive, it might more safely and advantageously be applied behind the stones or brick-work of wells, to prevent the clay or loam from being wasted by the action of the water.

4. *Byssus candelaris*, L. (*Lichen flavus* of Withering), or Yellow Powder-wort; an annual vegetable dust generated on old pales, the cracked bark of trees, and antique walls, in all parts of the world: it appears from September to June.—This powdery substance may, according to Böhmer, be employed for dyeing a very bright-yellow colour.

5. *Lycopodium clavatum*. See Club-moss, the Common.

MOSS, in *horticulture*, is a disease

ease which greatly impedes the growth of trees, and at the same time very materially injures the fruit of orchards.

The remedy usually employed is, to scrape off the moss with a kind of wooden knife, that will not wound the bark or branches; or to rub them with a strong hair-cloth, immediately after a heavy shower of rain. But the most effectual method, in Mr. BUCKNALL's opinion, consists in washing all the branches with soap-suds, and a hard brush, every spring and autumn. The action of rubbing, he observes, will so far invigorate the tree, as amply to compensate both the labour and expence: the plant will not be injured by this operation, which he directs to be performed in the same manner as a groom curries or scrubs the legs of a horse.—The most efficacious preventive, however, is to remove the cause, by draining all superfluous moisture from the roots; and, when the trees are first planted, by placing them on the surface of the ground, and raising a small mound of good fresh mould around them.

The moss, vegetating on shrubs, &c. is of various kinds, according to the nature and situation of the soil. If the young branches of trees be covered with long and shaggy moss, they will speedily perish; and can only be preserved by cutting them off near the trunk; or, by lopping the head of the shrub, &c. if it be found necessary; as it will sprout again with increased luxuriance. In thick plantations, however, and in a cold ground, the trees will always be covered with moss: in such cases, they must be thinned, and the land drained, or well stirred.

Where shrubs, fruit-trees, &c. are covered with moss, in consequence of the soil being *too dry*, it will be useful to spread large quantities of river or pond-mud about the root, and to open the ground for the admission of the manure: such expedient will not only cool the land, and greatly suppress the future growth of moss, but at the same time prevent the fruit from falling off too early—a circumstance that frequently happens in orchards planted in very dry soils. But, though moss be in general destructive to the vegetation of shrubs and trees, yet, if growing only on the *north side* of their trunks, it is attended with considerable advantage; insomuch, that it serves both to shelter them from the severity of the north winds, and also to direct the wandering traveller in his course; because it always points out that quarter of the compass.

MOSS, the MARSH, or *Mnium*, L. a genus of perennial plants, comprising 32 species, most of which are natives of Britain.—The following only deserves to be mentioned, namely, the *fontanum*, or Fountain Marsh Moss; it grows in low wet meadows, turf-bogs, and springs; where it flowers from May till August. This kind of moss, which may be seen at a considerable distance, serves as an excellent guide for discovering clear and cold springs: wherever it thrives, fresh water may be found, without the trouble of sinking *deep* wells.

MOSS-LAND, an expression used in Scotland, and also in various parts of England, for denoting what is more properly called a MORASS, BOG, or FEN.

The *theory* of mosses is foreign to our plan; and as we have already

ready stated the most approved methods of cultivating swampy soils, under the respective heads above mentioned, and also under the articles MARSH and MOOR; we shall now give the substance of an ingenious method of *converting* mosses into rich vegetable mould, proposed by Mr. JOHN SMITH, of Swindrig Muir, Ayrshire, Scotland; who published a small pamphlet on this subject, at Edinburgh, in 1798.

The first step will be to mark out proper main-drains for carrying off all superfluous moisture; at the same time taking care to preserve an accurate level. These drains should be eight feet wide at the top, four feet and a half deep, and gradually contract to two feet and a half in width at the bottom: they serve both to drain the soil, and to divide the field into inclosures, comprising from six to ten Scotch acres.

The ridges are next to be marked regularly, formed with a gentle declivity, and not too high; being six or seven yards in breadth, and worked with a spade in the following manner. A space of about 20 inches, in the middle of each ridge, remains untouched: on each side of which a furrow is made, and turned upon such central spot, so as to cover it completely. The labourer then continues to cut the moss with a spade to the width of about 12 inches, and to turn it over in the same manner as if it had been ploughed, till he arrives at the *division-furrow*; which ought to be about two feet in width, cut out, and thrown upon the sides of the ridges. The depth of this furrow varies according to circumstances; but it should be so regulated, as to answer the purpose of collateral trenches, serving to conduct the water into the main-drains.

All the ridges must now be *top-dressed* with *shell-lime*, in the proportion of from 160 to 200, or 220 Winchester bushels; which should be spread on the land during the summer, and (if possible), immediately after it has been slaked; because the lime, when acted upon by heat, the autumnal rains, and the winter frosts, putrifies more speedily, and thus prepares a proper mould.

The first and most beneficial crop to be raised from mosses, will be *potatoes*; for which purpose, beds from five to six feet broad should be marked out in the spring, across the ridges, with intervening furrows or trenches, about two feet in width. These beds must be covered with a thin layer of dung, on which the potatoe cuttings are placed, about 12 inches asunder; the whole is spread with a thin stratum of moss, that is succeeded by another layer, as soon as the potatoes appear above the surface of the ground. No hoeing or other cultivation is necessary, till the crop be taken up, which seldom amounts to less than 320 Winchester bushels.

When the potatoes are removed, the ridges should be formed a second time, in the manner above described; and the division-furrow cleared out, for the reception of oats, which are sown in the spring, and covered in by means of a small harrow drawn by two men. The amount of the crop is asserted to be, in general, about 60 Winchester bushels per acre; the grain being in all respects equal to that produced on other soils. So beneficial, indeed, are the effects of lime, in consolidating and ameliorating the moss, that *five*, and even *six*, successive crops of oats have been obtained, without any appearance of its being exhausted; and that often at the end of the second, and always of the third year, it acquires sufficient firmness to be ploughed by two horses, to within two *bouts* or stitches of the division-furrow. Farther, the seed should be harrowed in by horses; and, when the oats are ripe, they may be removed from the field in carts, without the moss sinking, or rendering the carriage difficult.

Such is the outline of Mr. SMITH's method, which deserves to be more generally known, especially in Lancashire, and those counties that abound with morasses or fens. We cannot, however, omit to mention, that some intelligent farmers conceive this mode of cultivation to be practicable only on *shallow* mosses; though, in the essay above cited, Mr. SMITH states that he has successfully practised it with such as were fourteen feet in depth.

MOSS-RUSH, or GOOSE-CORN, *Juncus squarrosus*, L. a native perennial plant, growing on heaths and barren turfy bogs; flowering in the months of June and July.—This vegetable indicates a *barren soil*: it is eaten by horses; but, being a very low plant, its leaves adhere so closely to the ground as to elude the stroke of the scythe.

MOTH, or *Phalæna*, a genus of insects comprehending several hundred species, which it would be needless to enumerate: they are uniformly bred from eggs, and are no sooner hatched than they construct for themselves a small habitation, in which they live; and may thus be easily distinguished from other insects, which do not form their *chrysalis* till they are about to change from a caterpillar state into that of a butterfly.

Most moths become nocturnal butterflies; though some species of these vermin, being real maggots, assume the shape of flies; and others that of chafers.

With respect to their abode, they are divided into *domestic*, *field*, and *aquatic moths*. The first is the small lead-coloured moth, that lives on fine furs and woollen goods, by the destruction of which it often occasions considerable damage: the two latter kinds prey on the leaves of trees, the fibres of wood, bark, &c.

The butterflies of the domestic moth are scarcely half an inch in length, and have four long wings that cover the whole posterior part of the body. From the early spring to Midsummer, they infest our dwellings, and during the night search for convenient places to deposit their eggs, which are scarcely discernible by the naked eye. These are hatched within three weeks, and produce very diminutive caterpillars with sixteen feet, and which immediately begin to weave, for their accommodation, a thin silken cover from their own substance, not unlike the silk-worm, and then gnaw off the wool and hair from the stuffs on which they are settled. Thus arises a cylindrical texture which, being open at both ends, is gradually enlarged with the growth of the insect. In order to extend this fabric, the caterpillar divides it longitudinally into two parts; weaves an intermediate piece between each section; and joins to both ends a small portion for enlarging its abode. The whole has externally the colour of the stuff from which it is taken, and the substance of the latter affords sustenance to the insect.

In this state, they remain nearly a whole year, and during that period greatly injure clothes or other articles manufactured of wool; though these destructive creatures fast for many days (probably when changing their skin), and also spend the whole winter in a torpid state. In the succeeding spring, they entirely close their case; change into a chrysalis; and, after a few weeks, appear in the shape of *moths*, which speedily propagate themselves in the manner of bugs. Some species, however, previously desert their habitation, and suspend themselves in the next convenient corner, where they undergo their transformation.—There is a peculiar kind of these vermin, called *bastard-moths*, the cases of which are open at one end; closely attached to woollen cloths, and removed only when they have devoured the whole substance around the spot: they are of a larger size than the true moths.—Another variety of the latter kind, preys only on the dry skins of animals, the leather covers of books, &c. but their cases are destitute of all motion.

Many remedies have been devised, with a view to extirpate, or prevent the generation of moths:—in the progress of the present work, we have incidentally mentioned various vegetables that may be usefully applied to that effect; but to repeat them in this place, would be superfluous; as the reader will find them pointed out in the General Index of Reference, annexed to the last volume of this Encyclopædia. Let it, therefore, suffice to observe, that one of the most speedy remedies for their complete extermination, is the *smell of turpentine*; whether this diffusible oil be employed in a liquid state, by sprinkling it on woollen stuffs, or placing sheets of paper moistened with it between pieces of cloth; or merely by evaporating the oil in shallow vessels, placed contiguous to the articles infested with moths, its effects will be equally certain.

It is remarkable, that moths never infest the fleeces on the backs of animals; nor even *unwashed wool*; so that they always abandon the place where such raw material is kept. Hence those persons, to whom the smell of turpentine is too offensive, may avail themselves of this circumsrance, and place layers of undressed wool between pieces of cloth, or put small parcels in the corners of shelves and drawers containing drapery of that description. For the discovery of this curious and useful fact, we are indebted to M. REAUMUR.

Another, though more disagreeable mode of exterminating moths, is the smoke of tobacco, which infallibly kills them; but the articles thus fumigated should be afterwards exposed to the air, which speedily dissipates the peculiar smell of that narcotic herb.

MOTHER-OF-PEARL. See MUSCLE, the Pearl bearing.

MOTHERWORT, the COMMON, LION'S TAIL, or *Leonurus Cardiaca*, L. an indigenous plant, growing in hedges, rubbish, on dunghills, and calcareous soils; flowering from June till August.

The leaves of the Motherwort possess a strong, disagreeable odour, and a bitter taste.—Goats, sheep, and horses, eat this vegetable, but cows do not relish it; and it is totally refused by hogs.—DAMBOURNEY dyed woollen cloth of an excellent dark olive-colour, from a decoction of this plant.

MOULD, a general name for

the soft earthy substance that serves as the upper stratum of land; and in which all kinds of vegetables strike root and thrive.

Mould consists of the following ingredients; viz. sand, clay, and talcum, or magnesian earth; carbon derived from decayed vegetable and animal substances; the carbonic acid, and water. The good or bad qualities of the soil depend upon a proper mixture of these ingredients; though, if the carbon, the carbonic acid, and iron, be wanting, the fertility of land will depend on its capacity to retain the quantity of moisture, which is necessary for the nutriment of vegetables.

The relative utility of mould, for the different purposes of the gardener, may be ascertained by the sight, smell, and touch. The best is of a light brown or hazle colour; it cuts easily, and does not adhere to the spade, being light, friable, and crumbling into small clods. The next in quality are the dark-grey and russet-coloured moulds; but the worst are those of a very light, or very dark ash-colour, such as are generally found on barren heaths and commons, where they seldom produce any thing except furze and fern.

With respect to smell, MILLER observes, that the best time for judging by that sense, is immediately after rain has moistened the soil; when the mould, if it be rich and good, will emit an agreeable odour. But the most accurate criterion is the *touch*; as it may thus be ascertained whether the mould be too sandy, or abound with too much clay; whether it be fatty and slippery; or harsh, porous, or friable. The most fertile, by this test, holds a medium between the two extremes; being easily soluble, consisting of equal parts of sand and clay; and not adhering to the spade, after gentle showers.

MOUSE, or *Mus*, a genus of quadrupeds, comprising sixty species, of which the following are found in Britain, namely:

1. The *sylvaticus*, or Long-tailed Field-mouse, the length of which is in general from eight to nine inches, including its tail.—These animals are found in fields, gardens, and shrubberies, where they do incalculable damage; burrowing under the ground, and digging up grain, acorns, pease, or beans, &c. when newly sown; which they carry to their subterraneous granaries. Their habitations may be discovered by the small mounds of earth, that are raised on, or near, the entrance of their abode; or by the passages leading to their nests, or storehouses: and, by following the course of such passages, the vermin may be easily destroyed.

Another method of extirpating field-mice, is by traps, consisting simply of a flat stone that is supported by a stick; and beneath which is placed a roasted walnut. They are speedily attracted by the smell of the walnut, which they prefer to acorns or cheese; and, as it is fixed to the stick, that yields as soon as it is touched, the stone falls upon them, and terminates their existence. But the most effectual mode of destroying these animals, would be to encourage the breed of owls, which is so active in the pursuit of nocturnal vermin.

2. The *messorius*, Harvest, or Smaller Long-tailed Field-mouse, which is by some considered as a variety of the former species; and is very small and slender; its

whole length, together with the tail, not exceeding $4\frac{1}{2}$ or 5 inches. It chiefly infests the county of Hants, where it is very numerous, especially during the harvest.—This creature constructs its nest of a circular form, with blades of corn, which it deposits above the surface of the ground between the straws of standing grain, and frequently in thistles, where the female produces from six to eight young ones at a time.

The harvest-mice never enter houses; but are often carried into ricks, among sheaves of corn; *one hundred* having sometimes been found in a single rick, on taking it down to be housed. Those remaining in the field, shelter themselves during the winter beneath the ground, into which they burrow deeply, forming their beds or nests, of decayed grass. They may also be taken by means of the traps above mentioned.

3. The *musculus*, or Common Mouse, which has a very long, scaly, and almost naked tail; exclusively of which, it is about three inches and a half in length. This species is uncommonly prolific, producing several times in the year, five or six young at a litter.

There are several varieties of the common mouse, which are chiefly distinguished by their colour, such as black, yellowish, spotted, &c.; but the most rare and beautiful are white, with red eyes—they are in some degree capable of being tamed, especially by means of music, to which all mice are singularly attached.

The common mouse inhabits all temperate climates, and is chiefly found in houses and in barns, whither it resorts for the sake of food, devouring grain, bread, cheese, butter, oil, &c. It is exceedingly timid, and very nimble; never leaves its abode excepting for food; and retires on the slightest alarm.

These little depredators may be destroyed in houses by the common traps, baited with cheese: in barns, it will be necessary to allure them by means of singed leather, grease, or other animal food; and, in chambers where cheese is preserved, with malt-meal. As, however, all these methods are troublesome; and, as the exposing of poisonous substances may be attended with danger, we shall communicate a remedy that is both safe and efficacious: Take a few handfuls of wheaten flour, or malt-meal, knead it into a dough, and let it grow sour in a warm place; then mix with it finely levigated iron filings, form the whole into small balls, and put them into the holes frequented by mice. On eating this preparation, they are inevitably killed.

Another way to extirpate them is, by keeping cats, dogs, owls, or hedge-hogs, in the places infested with mice or rats. But the most effectual method of *preventing* their devastations in barns, the floors of which they frequently undermine, consists in laying beneath the latter a stratum of flints, fragments of glass mixed with sand, or broken cinders. It has likewise been proposed to construct such floors on piers of brick, raised about 15 or 18 inches above the ground, so that dogs or cats may have a free passage beneath the building.—See also CORN, vol. ii. p. 69; and MULLEIN.

4. The *arvalis*, or Meadow-mouse, is from three to six inches in length; dwelling in bushy places,

corn-fields, meadows, and gardens, chiefly near waters. It subsists on nuts, acorns, pease, and grain, which last it prefers to every other kind of food, collecting considerable quantities in its subterraneous residence.

As soon as the corn is ripe, the meadow-mice assemble together in corn-fields, where they commit great ravages, by cutting down the stalks of corn with their teeth, and robbing the ears; nay, they follow the reapers, consume all the fallen or neglected grain, and, when the gleanings are devoured, they flock to the newly sown fields, and destroy the crop of the succeeding year. Being very prolific, the females produce from eight to twelve at a litter, several times in the year. During the winter, they retire to woods, coppices, &c. where they subsist on acorns, hazle-nuts, and the seeds of trees.

In some seasons, the meadow-mice become so numerous, that they would consume every esculent, if they did not destroy each other. Hence, in unproductive years, their numbers are greatly diminished, not only by devouring their own species, but also by becoming the prey of the long-tailed Field-mice, of foxes, wild-cats, weasels, and especially of dogs.

MOUTH, in anatomy, a part of the face, comprehending the lips, gums, inside of the cheeks, palate, &c.

The mouths of different animals are admirably adapted to various uses, according to their size and nature; being well formed and calculated for the reception and mastication of food, the seizing of prey, &c. It would, however, be incompatible with our design, to enter into any details relative to the organization of this part; we shall, therefore, concisely state only a few of the diseases incident to the human mouth.

1. Affections of the TEETH, and GUMS, which are discussed in their respective places.

2. CANCERS, which see.

3. If the mouth be affected with excruciating pain, the internal application of opium will afford considerable relief. But, if any tumors or swellings arise, it will be advisable to apply externally cataplasms of marsh-mallow, and other emollient vegetables, or poultices of bread and milk. When the tumefied parts continue very painful, without suppurating, it will be proper to lance them, in order to reduce the swelling. The patient ought, at the same time, to avoid speaking; and to take no such food as is either of an acrid and stimulating nature, or requires any efforts of mastication. Hence, he ought to subsist principally on liquid, mucilaginous aliment; and his drink should be sweetened with honey, which in itself is one of the best balsamics.—See GARGLE.

MOWING, the act of cutting down grass, &c. with the scythe.

This method of *reaping* has hitherto been practised chiefly on oats, clover, and the grasses; but there is no doubt that it may, with advantage, be extended to wheat, and every other kind of grain; for the following obvious reasons: 1. Mowing is much easier, and less fatiguing to the labourers, than reaping. 2. It is more expeditiously performed. 3. It requires a smaller number of hands. 4. It affords employment for children, aged men and women, who are almost past labour, in gathering the corn, and other lighter branches of the work.

5. The grass being mown together with the straw, the quantity of the latter is increased, while it becomes of greater value as fodder. Lastly, the grass produced on fields which have been mown, vegetates with increased luxuriance, and furnishes excellent pasture for cattle, and particularly for cows, when the harvest is closed. Hence Du Hamel infers, that a farmer may, by this practice, not only keep a larger number of cattle, but at the same time save his hay, and obtain a greater quantity of dung.

It may probably be objected, that, if a wet harvest should occur, *mown wheat* will sprout more speedily than that which is *reaped*. This injury, however, may be effectually prevented, by disposing the sheaves *triangularly*, so that the head of one may rest upon another. The only requisite to effect this, is a little dexterity in closing the triangle, so that the basis of the third sheaf may serve to support the heads of the first and second.

We cannot conclude this article, without noticing an easy method, by which the operation of mowing may be greatly facilitated. According to the present mode of cutting grass, the workmen trace *two parallel lines* with their feet, which they move forward alternately, after every stroke of the scythe: instead of which, Du Hamel recommends the mower's path to be traced *only in a single line*; because he ought to advance with one foot before the other, in such a manner that the left (which is behind), should always forward the right foot. This simple practice deserves commendation; for the labour will not only be performed with more speed, but likewise with greater ease to the mowers, who will thus be secured from those sudden cramps in their left sides, with which they are frequently seized, in the prevailing system of using the Scythe.

Mucus. See Nostrils.

MUD, the slime or miry earth usually found at the bottom of ponds, and stagnant waters. It also signifies the dust or dirt of streets and roads, rendered fluid by rain.

Mud is chiefly useful as a manure for *loamy* soils; though it may also be applied with advantage to any other land. The best kind is that taken from ponds which have received the draining of farm-yards. The sweepings of London streets have likewise been found of considerable service, when mixed with a little horse-dung, in order to ferment, before it is carried on the land. Thus prepared, it has been spread in the proportion of ten or twelve loads per acre, and been productive of the most beneficial effects.—See Manure.

MUGWORT, or *Artemisia*, L. a genus of perennial plants, comprising 49 species, five of which are indigenous: among these, the following are the principal.

1. The *maritima*.—See Wormwood, the Sea.

2. The *Absinthium*, Mugwort, Common Wormwood, or Wormwood-Southernwood, growing on road sides, rocky places, and on rubbish; it flowers in August.—This herb is extremely bitter; and, if it be infused in wort, as a substitute for hops, it renders the ale very pernicious to health, on account of its intoxicating effects.—On distilling the leaves and flowers, they yield a

considerable quantity of essential oil, which is used, both externally and internally, for destroying worms.—If the leaves be put into sour beer, they speedily correct its acidity; and, being excellent antiseptics, they are often employed in fomentations, to resist putrefaction.—According to WITHERING, an infusion of these leaves is a good stomachic; and, with the addition of fixed alkaline salts, proves a powerful diuretic in some dropsical cases. Their ashes produce a purer alkali than most other vegetables. An infusion of the same herb, given to a suckling woman, renders her milk bitter; and, if the plant be eaten by sheep, it also imparts a bitterness to mutton.—Although turkeys are fond of it (on the authority of Mr. HOLLEFEAR), yet it is not relished by horses and goats, while it is refused by cows and swine.—If the plant be macerated in boiling water, and repeatedly applied to a bruise, by way of cataplasm, it will not only speedily remove the pain, but also prevent the swelling and discoloration of the part.—In dyeing, a decoction of the Common Wormwood produces, with the addition of alum, &c. various shades of yellow; and, if such liquor be applied to bedsteads, chests of drawers, and similar articles, it prevents the generation of vermin.—The smoke arising from the lighted bundles of this herb, expels bees from their hives, when honey is to be collected, without destroying these useful insects.

3. The *vulgaris*, COMMON MUGWORT, or SOUTHERNWOOD, which grows on the borders of fields, ditch-banks, and on rubbish; it also flowers in August.—This species, possessing a more agreeable flavour, is in some countries used as a culinary aromatic: a decoction of it, is often taken by country-people, for curing intermittent fevers.—The Chinese employ the fresh plant bruised, for healing wounds: and, according to Dr. HOME, a dram of the leaves, dried and pulverized, if taken four times a day, has effectually removed hysteric fits, after æther and asafœtida had failed of procuring relief.—Dr. ANDERSON remarks, that sheep are very fond of the Common Mugwort, devouring it with great avidity, especially the roots; though, according to LINNÆUS, these animals, as well as swine, totally refuse it; and horses, cows, and goats do not relish it.

MULBERRY-TREE, or *Morus*, L. a genus of exotics, comprising seven species, of which only the *nigra*, or Common Mulberry-tree, is cultivated in Britain, on account of its black fruit.

It is propagated both by layers, and by cuttings, which last are preferable; because, when judiciously selected, and properly managed, they will speedily strike root. For this purpose, the cuttings ought to be taken from shoots of the preceding year, with one joint of the two years' wood at the bottom, and to be set towards the end of March, in beds of rich light earth, which should be pressed closely around them. If they be placed beneath glasses, their growth will be remarkably promoted; but, if the young plants be exposed to the air, it will be necessary to shelter them from the severity of winter, with moss; a precaution, which at the same time renders it unnecessary to water them frequently.—In the succeeding spring, they should be removed to the nursery, and trained to a stem; the more luxuriant branches being carefully pruned, to prevent their too rapid growth; and, in the course of about four years, they may be finally transplanted to the place where they are destined to remain.

Mulberry-trees thrive best in a light, rich soil, and an open situation; for, if they stand too near houses or other buildings, or contiguously to shady trees, their fruit seldom attains to maturity. It will, however, according to the experience of Miller, be of considerable advantage to defend them from the west, and south-west winds, by trees, or walls, placed at a small distance.

The fruit of this species, if eaten before it be thoroughly ripe, is very astringent; but its syrup affords an excellent gargle, for mitigating inflammations of the throat, and ulcers of the mouth. The berries, when perfectly mature, are grateful to the taste; they produce both cooling and laxative effects, while they contribute to allay thirst. Their juice is employed to impart a dark tinge to liquors and confections, which stain the fingers as well as linen of a red colour, that is very difficult to extract. Spots of this kind, however, may be removed from the hands by verjuice, the acid of sorrel, and that of lemons; but, for linen, the best method is to wash the stained part with warm water, and to dry it with the vapours of sulphur, which immediately remove the spot.

The fruit of the common mulberry-tree, when properly fermented and prepared, yields a pleasant vinous liquor, known under the name of mulberry-wine. Considerable quantities of these berries are likewise consumed in the cyder counties, particularly in Devonshire, where they are mixed with apples, &c. in making a delicious beverage called *mulberry-cyder*. For this purpose, the ripest and blackest mulberries are selected, and the expressed juice is added to the cyder, in such a proportion as to impart a perceptible flavour. The liquor thus acquires a very pleasant taste, as well as a deep red colour, similar to that of the finest Port-wine, both of which continue undiminished by age.

The *bark* growing on the root of the Common Mulberry-tree, has an acrid bitter taste, and is a powerful *cathartic*: hence it has been successfully used as a vermifuge, particularly in cases of *tænia*, or of the tape-worm: the dose is half a dram of the powder, or a dram of the infusion.—The wood of the tree is yellow, tolerably hard, and may be applied to a variety of uses in turnery and carving. It is, however, necessary to steep it in water before it is worked; in order to remove the tough and fibrous bark, which is capable of being converted into strong cordage, ropes, and brown paper.

There are several other species of this tree (particularly the *alba*, or White Mulberry) which are cultivated to a considerable extent on the Continent, for their mucilaginous leaves, that afford a most grateful food to silk-worms; but, as various unsuccessful experiments have been made with a view to introduce their culture into Britain, they are seldom raised, excepting by way of ornament, in the hot-houses of the curious It deserves, however, to be stated, on the authority of Bechstein, and other continental writers, that the last mentioned species is better calculated to withstand the effects of severe frosts than the common Mulberry-tree; that it is, therefore, preferably cultivated in the northern parts of Germany, for instance, Saxony, Brandenburg, Pomerania, and Prussia; where it thrives with uncommon luxuriance, if planted in a moderately rich, though sandy soil; and if properly sheltered from the cold north-winds.—This observation is amply confirmed by the considerable quantities of raw silk annually produced in the Prussian dominions from the leaves of that tree, which afford the most proper nutriment to silk-worms.

MULE, or *Equus Mulus*, a mongrel kind of quadrupeds, partaking both of the nature of a horse and an ass.

Mules are very hardy animals, and therefore much used in warm climates, where they are preferred to horses, for the purposes of either draught or carriage. Considerable numbers are likewise employed in Ireland, and in some of the northern counties of Britain, on account of their great strength and durability.

These animals sometimes attain the height of 15 or 16 hands; though, in general, they do not exceed 14. When in good condition, they are worth from 20 to 40, and even 50l. each, being particularly calculated for carrying heavy burthens. They are, besides, sure-footed, and attain a great age; instances of mules thirty years old, having occurred in Ireland, and which, nevertheless, were in the full possession of their vigour.

The mules bred in cold countries, are reputed to be more hardy, and fit for labour, than such as are reared in warm climates. Hence they deserve to be more generally propagated in Britain. For this purpose, however, it will be requisite previously to procure a strong male ass, and two females, which should be well fed and kept in good order. Their colts ought, likewise, to be carefully attended, fed, and littered, being kept under shelter in the winter, and the stable-door left open in the summer, that the animals may exercise themselves in the air, for one or two hours, during the middle of the day. By such management, the breed of colts will be considerably improved; and, at the end of three years, the males will be fit for the purpose. The mares selected for the stud, should be young, of a lively turn, small limbed, and with a head of a moderate size. These, with proper attention, will drop foals; each of which, at the age of three months, are said to be worth from ten to twenty guineas.

During the first winter, it will be necessary to *house* the mule colts, so that they may be frequently handled, in order to render them tractable. When three years old, they may be *broken in*, but it will not be advisable to work them to any considerable extent, till they have attained the fourth year of their age; after which time they will, if properly treated, continue in full vigour till they are past thirty, and even forty years.—It should, however, be remarked, that no wheat, or rye-straw, ought to be given them for their food, whether whole or cut; as it greatly disagrees with their nature, and incapacitates them for performing hard labour. —By the 38th Geo. III. c. 41, § 2,

§ 2, the sum of 6s. is made payable for every *mule, horse, mare,* or *gelding*, kept by any person, and not charged with any other duty. Exceptions, however, are made in favour of *post-horses*, and others, which being unconnected with domestic economy, we forbear to specify.

MULE, a term which denotes any production, whether of the animal, or vegetable creation, that originates from two different species.

Thus, beside the animals properly denominated *mules*, it appears, that the different breeds of sheep may be advantageously *crossed*.—LINNÆUS observes, that the breed from *Swedish* ewes and *Spanish* rams, resembled the Spanish sheep in wool, stature, and external appearance; but was, in all respects, as hardy as the Swedish sheep: the contrary effect resulted from Swedish rams and Spanish ewes. He farther remarks, that an English ram *without horns*, and a Swedish *horned* ewe, produced sheep destitute of that ornament. These facts are equally curious and valuable: they require no commentary, to recommend them to the attention of breeders in general.

The *vegetable mules* are very numerous; and, by scattering the farina, or fecundating dust, over female flowers, several excellent varieties have often been obtained.—Thus, in the first volume of the *Letters and Papers of the Bath and West of England Society*, we meet with an interesting account of a *mule-cabbage*, which is said to fatten cattle six weeks earlier than *turnips*. The correspondent states, that the sort of cabbage principally raised, is the Tallow-loaf or Drum-headed Cabbage; which being too tender to withstand the severity of the frost, he planted some of this species and of the common Purple Cabbage for pickling, alternately: when the seed-pods were perfectly formed, he cut down the purple, and left the other for seed. The result completely answered his expectations; namely, the produce was a mixed stock, of a deep green colour, with purple veins; and which retained the size of the drum-head, while it acquired all the hardiness of the purple. This is one of the most successful experiments with respect to vegetable improvements: and, without quoting other instances, related in the subsequent volumes of the same valuable collection, as well as in other works, we trust these few facts sufficiently evince the practicability of the plan; and hope they will not be disregarded; because such attempts not only tend to enrich our *practical* knowledge, but at the same time afford additional proofs of the wisdom, and beauties, of the creation.

MULLEIN, or *Verbáscum*, L. a genus of plants, comprising 17 species, five of which are indigenous: the principal of these are:

1. The *Thapsus*, GREAT WHITE MULLEIN, HIGH TAPER, COW'S-LUNGWORT, or LADIES' FOXGLOVE; growing on chalky and gravelly soils, and on dry ditch-banks; flowering in the month of July.—HOCHHEIMER informs us that the roots, stalks, and flowers of this plant, after being properly cleaned of the adhering earth, and other impurities, have long been used in German granaries, where bundles of it are placed in every corner, and on the grain itself, in order to prevent the depredations of *mice*. It affords so complete a security from these vermin, even

in barns, that they suddenly disappear, and shun the place for several years after this vegetable has been deposited.—According to Bechstein, the root of the Great Mullein, reduced to powder, and mixed with malt-meal, speedily fattens capons and chickens.—The herb, in a dry and pulverized state, corrodes the fungous flesh of ulcers; and, if applied while fresh, heals the wounds in the foot of a horse, occasioned by improper shoeing.—The flower of this, and the following species of the Mullein, impart a delicate, though not durable, yellow-colour, to wool and cotton; but, on the addition of blue, these stuffs acquire a blue shade of incomparable lustre.—The woody stalks covered with pitch, make excellent flambeaus.—The seeds, when thrown into water inhabited by fish, produce an intoxicating effect, so that these creatures suffer themselves to be caught by the hand.—In Norway, the farmers give the herb medicinally to their cows, when threatened with consumption; and employ its downy fibres as a substitute for tinder.—Neither cows, goats, sheep, horses, nor swine, will eat this vegetable.

2. The *nigrum*, Dark, or Black Mullein, which grows in hedges, and on road-sides; is perennial; and flowers from July to September.—This plant is justly admired for its beauty; the stem is covered with hairs elegantly branched, and has yellow blossoms tipped with purple:—Bees visit its flowers, which to them are exceedingly grateful.—Swine eat the plant; but it is neither relished by sheep, nor touched by cows, horses or goats.

MULLET, or *Mugil*, L. a genus of fishes, consisting of two species, principally distinguished by the number of rays in the back-fin.—Both frequent the sandy coasts of this island, and particularly small bays that admit influxes of fresh water. Hither they resort in considerable shoals; and, similar to hogs, grub in the sand or mud, leaving their traces in the form of large round holes.

Mullets are extremely cunning: when surrounded with a net, the whole shoal frequently escapes by leaping over it; for, if one take the lead, the others instinctively follow; but, if they fail to effect their object, they remain motionless in the water, as if resigned to their fate.

In the South of France, abundance of these fish are taken in shallow waters, by means of *weirs* constructed with reeds. From the milts of the males, called *alletants*, and the roes of the females, denominated *botar*, the inhabitants prepare a kind of food, called *botargo*. These parts are taken out entire, covered for four or five hours with salt, then pressed between two boards or stones, afterwards washed, and, lastly, dried in the sun for about a fortnight.

As an article of food, the mullet affords a tolerable dish, being more tender than the haddock, and less juicy than the carp: it is not, however, so delicious as the ancient Roman mullet, which appears to have been a different species.

MUM, a kind of malt-liquor which is in great request on the Continent, whence considerable quantities are imported. It is prepared in the following complicated manner: Seven bushels of wheaten malt, one bushel of oatmeal, and a similar portion of ground beans, are brewed in sixty-three gallons of water, which has been previously boiled. The liquor is next poured into a hogshead; and, as soon as it begins to ferment, three pounds of the inner rind of fir, one pound of the tops of fir and beech, three handfuls of the blessed thistle, and one or two handfuls of the flowers of round-leaved sundew *(Drosera rotundifolia,* L.*)*, are thrown into the vessel. To these are added a handful of burnet, and a similar quantity of betony, marjoram, avens, penny-royal, and wild thyme; two handfuls of elder-flowers, thirty ounces of bruised cardamom-seeds, and one ounce of bruised berberries. The whole mash is now suffered to work gently for a little time, when the hogshead is filled up, and ten new-laid eggs are thrown in, unbroken; after which the vessel is closed, and, at the end of two years, the liquor is fit for use.

Such is the method said to be practised at Brunswick, where the best mum in Germany is brewed. The only variation made by English brewers, is the substitution of cardamom, ginger, and sassafras, for the inner rind of the fir-tree; and the addition of elecampane, madder, and red sanders.

To those whose palate requires the stimulus of viscid and spicy preparations, *mum* is doubtless a grateful beverage; and a pint of it, taken at night, may serve as a sudorific in recent catarrhs and rheumatic attacks.—The Germans drink it frequently, in consumptive habits; as an opinion prevails among them, that such liquor contributes to obesity, and increases the muscular energy.

Mum pays on importation the sum of 10s. 9½d. per barrel of 32 gallons; but is allowed a drawback of 7s. 10d. on exportation.—The home-made liquor is under the cognizance of the excise.

MUMMY, in horticulture, signifies a kind of wax employed by gardeners, in grafting and planting the roots of trees. It is prepared as follows: Take one pound of black pitch, and a quarter of a pound of turpentine, mix them in an earthen pot, and set the whole on fire in the open air: the mixture should be alternately quenched and lighted, till all the nitrous and volatile parts be evaporated, when a little common wax is to be incorporated with the composition, which is now fit for use.

MUMPS, or *Cynanche parotidæa*, a contagious disease, that chiefly affects the lower classes, and is often epidemic.—It is distinguished by an external moveable swelling, that arises on one side of the neck, but more commonly on both, and frequently attains a considerable size; while the fauces appear red, and the patient has a sensation of straitness. The powers of respiration and of deglutition are somewhat impeded, and the disease is mostly accompanied with a slight degree of inflammatory fever. The tumor increases for three or four days; when it begins to subside, and, in a few days, totally disappears, together with the fever. Next, it is remarkable, that the contents of the scrotum in males, and the breasts of females, become affected with large hard, and often painful swellings, which generally subside in a few days. Sometimes, however, the tumor in the fauces is suddenly suppressed, and not attended with the last mentioned symptom; in which case the fever increases rapidly, is often succeeded by delirium, and has sometimes proved fatal.

The mumps being a disease which commonly terminates without danger, it is scarcely necessary to specify any remedies. The principal requisite is, to keep the head and face warm, to avoid taking cold, and to regulate the bowels by the mildest cooling laxatives.—But, should the tumor in the neck suddenly vanish, and the inflammatory fever increase, so as to induce an apprehension that the brain will be affected, it will be advisable to promote and reproduce the swelling by warm fomentations; and, to obviate the fatal consequences that may result from its sudden repression, by means of emetics, venesection, or blisters, according to the nature of the case.

MUNDIC, or MARCASITE, a species of copper-pyrites found in the tin-mines of Cornwall, and in other parts of the world. It is of various colours, being sometimes yellow, green, or white; but is easily distinguished by its glittering, and frequently contains a considerable portion of copper.

The steams of this mineral are very offensive to the miners; they are, however, reputed to be a good vulnerary, and are the only remedy employed by the labourers in tin-mines, who wash their wounds in the water which runs from the mundic-ore.

MURRAIN, a contagious disease incident to cattle; it is known by the animals hanging down their heads, which are swollen; by short and hot breathing; palpitation of the heart; staggering; an abundant secretion of viscid matter in the eyes; rattling in the throat; and a shining tongue.

The murrain is occasioned by various causes, but principally by a hot, dry season, or a general corruption of the air; in consequence of which, the blood becomes inflamed; the symptoms above stated speedily appear; and, if no precautions be taken, the disease suddenly proves fatal. It raged about the middle of the last century in various parts of the Continent, and carried off great numbers of cattle. The remedy then employed, both for its prevention and cure, consisted in a mixture of equal parts of gunpowder, salt, soot, and brimstone: one spoonful of this composition was given for a dose, and washed down with warm water.

In the 36th vol. of *Annals of Agriculture*, the following recipe is inserted for the *murrain in hogs*: A handful of nettles is to be previously boiled in a gallon of small-beer, when half a pound of flour of sulphur, a quarter of a pound of elecampane, three ounces of liquorice, and a quarter of a pound of aniseeds, are to be added in a pulverized state. This preparation should be administered in milk, and the quantity here stated, is said to be sufficient for six doses.

But the most effectual preventive of this destructive contagion is, to keep the cattle cool during the summer, and to allow them a sufficiency of water: all carrion should be speedily buried; and as the feeding of those useful animals in wet places, or on rotten grass or hay, frequently causes this malady, their food ought to consist of dry and sweet fodder.—See also DISTEMPER.

MUSCLE, or MUSSEL, *Mytilus*, L. in ichthyology, a genus of shell-fish, consisting of several species;

the following of which are the principal; viz.

1. The *margaritiferus*, or pearl-bearing muscle, having a compressed shell, the inside of which is exquisitely polished, resembling in whiteness and brilliancy the real pearl. After being divested of its external laminæ, by aquafortis, and the lapidaries' mill, the outer part acquires a similar lustre.—This is the true mother-of-pearl shell, which is converted into various toys, such as snuff-boxes, buttons, spoons, &c.

2. The *edilis*, or eatable muscle, which has a strong shell slightly curved on one side, and angulated on the other. It is found in immense beds, both in deep water, and above the low-water-mark, in the British seas.

The muscle is not only persecuted by numerous enemies, in its own element, but also subject to certain diseases, which have been conjectured to be the cause of the ill effects consequent on the eating of these shell-fish. There are two disorders of that tendency, which, by Dr. Mœhring, are termed the *moss* and the *scab*. The former is occasioned by the roots of moss being introduced into the shell, so that the water penetrates, and gradually dissolves the fish. The *scab* is caused by tubercles, that are produced by the dissolution of the shell.

Whatever may be the cause, it is well ascertained, that the eating of muscles has sometimes produced cutaneous eruptions; restlessness and agitation; an insupportable itching throughout the whole body, together with erysipelatous inflammations. These complaints, however, may be easily removed by the liberal use of oil, emetics, and of milk; as they have in no instance proved *mortal*.

The edible muscle, nevertheless, furnishes a rich food, though it be difficult of digestion. Even in a sound and fresh state, it is to some constitutions hurtful; and, if contaminated by disease, it becomes, in some degree, poisonous.—As muscles are most detrimental to health, when eaten *raw*, it will always be advisable to boil them with onions; but they should be previously washed with vinegar, and seasoned with pepper: thus qualified, they cannot be injurious, unless eaten to excess, or too frequently.

MUSCLE, in animal economy, a fleshy, fibrous part, destined to be the instrument or organ of motion.

A muscle is composed of a great number of thin parallel plates, each of which is divided into smaller fleshy threads or fibres, and inclosed in its proper cellular membrane.—The muscles are divided into three parts, namely, the *head*, *belly*, and *tail*: the first and third are firmly attached to the bones; whereas the *belly* adheres loosely to other parts, by means of the cellular membrane which swells, when the muscle acts. Their substance is fleshy in the middle, but tendinous or sinewy in the extremities: the fibres of the former are sensible and irritable, while those of the latter are destitute of all sensation.

All the muscles act, by the inflation of their *bellies*; in consequence of which they are compressed or shortened. Thus, in muscular contraction, the moveable bone only is drawn in the direction of the fibres, while the other bone, to which the muscle is attached,

tached, remains fixed. Hence they operate in some measure as a lever; the two ends of every muscle being fastened to the bones by means of the tendons; but, if any fibre or nerve of the muscle be divided, or only obstructed by a ligature, the power of contraction instantly ceases.

Various denominations have been given to the muscles, according to the different parts where they are situated; but, as these particulars belong to the province of anatomy, we shall only mention, that their number in the human body amounts to about 450, while some of the lower animals are provided with several thousand.

Lastly, the colour of the muscles, in healthy individuals, is deep red; but, in dropsical, or those persons whose humours are in a vitiated state, it is of a paler hue. In the aged, the muscles contract and become rigid:—to retard this inactive and feeble state, there appears to be no better preventive than the frequent resort to the tepid bath; and the constant wearing of flannel next the skin, with a view to promote an uniform degree of insensible perspiration.

MUSHROOM, or *Agaricus*, L. a genus of plants, comprising numerous species, of which more than 300 are natives of Britain; among these, the following deserve to be specified:

1. The *semi-globatus*, or Semiglobular Mushroom, the gills or under part of which are fixed, and when quite young, of a whitish colour: the edges soon become entirely grey or mottled; and, when old, acquire a chocolate tinge. The stem is hollow, growing two or three inches high, and about the size of a crow's-quill. This species is found in great abundance on grass-plats, and on pastures, chiefly between the months of July and October; when it ought to be carefully avoided, being one of the poisonous fungi, the inadvertent eating of which has frequently proved fatal.

2. The *muscarius* (Musky), or rather Fly-killing, Reddish Mushroom, has a large head, which is nearly flat, being generally either white, reddish, or of a crimson hue, and covered with raised, compact, angular warts, that are sometimes thin, ragged, and flat. Its stem is solid, but the pith, or internal substance, shrivels as it becomes old, leaving irregular cavities: it grows in pastures from three to five inches in height, and is from three quarters to an inch and a half, in diameter. Among fir-trees, its head is sometimes twelve inches broad, and the stem from four to six inches high.—This species is also poisonous; and, if mixed with milk, is said to destroy flies: the expressed juice from this plant, when rubbed on walls and bedsteads, has been employed to expel bugs.—Gesenius, a medical author of great reputation, observes, that the celebrated *nostrum* sold at Frankfort, in Germany, under the name of *Ragolo's Anti-epileptic powders*, is supposed to consist of the Reddish Mushroom mixed with distilled oil, and pulverized valerian: this remedy is considered, on the Continent, as the only safe and certain specific for the cure of that dreadful malady.

3. The *clypeatus*, or Long-stalked Mushroom, which has a hollow, white, viscid, tender stem, that grows to the height of four inches; and is, in general, not thicker than a crow's-quill. It is

found in the month of September, in wood-lands and pastures; is highly deleterious; and, if improvidently eaten, causes great swelling, sickness, looseness, and other fatal symptoms.

These are the principal poisonous species growing in this country; but there are doubtless many others, equally pernicious, though not generally known. — On the other hand, the harmless and esculent mushrooms, are chiefly the following:

4. The *campestris*, Champignon, or Common Mushroom, the stem of which is solid and white, usually 3-4ths of an inch high, and of the thickness of a swallow's quill. Its gills, when first expanded, are of a bright-red colour, which gradually acquires a darker shade, till they become of a deep-brown cast. This plant at first represents a small globular figure, not unlike a hazlenut; in which state it is free from worms, and eatable; as the skin, in which it is enveloped, may then be easily separated from its white, juicy flesh: by this circumstance, it will be readily distinguished from a similar plant, the *agaricus vernus*, which is said to be poisonous.— The common mushroom is found in woods, old pastures, and at the side of roads, where it attains to perfection in the month of September.

5. The *orcades, v. pratensis*, or Meadow Mushroom (by some also called *champignon*) is very frequent on heaths, and dry pastures, being generally found in circular clusters. The cap is of a pale brown, nearly flat, and from one to three inches in diameter. Its stem is very tough, solid, and white; grows generally to the height of an inch and a half, and as thick as a crow's quill.—This species is also eatable in September: it possesses but little smell, while raw, and is somewhat dry; yet, when broiled or stewed, it imparts a pleasant flavour.

6. The *cantharellus (Merulius cantharellus* of WITHERING), or Chantarelle Mushroom, is wholly of a yellow cast, similar to that of the yolk of an egg. Its stem is solid, tapering downwards, being from one to two inches high, and from 1-4th to 3-4ths of an inch in diameter. It is found in woods and dry pastures, from July to September. This plant, when boiled with salt and pepper, possesses the flavour of a roasted cockle: it is esteemed, together with the preceding species, as a great delicacy.

7. The *deliciosus*, or Orange-coloured Mushroom, grows from one to two inches high: its stem is from 1-4th to 3-8ths of an inch in diameter, and is crowned with a flat cap, from one one-half to three inches broad, and of a rich reddish-brown colour; but its flesh is of a pale orange cast.—In its sensible properties, this species is similar to the preceding. It is in season in the month of September, and is found in dry and elevated woods.—The Italians, especially at Genoa, preserve it in olive-oil, and esteem it as great a delicacy as the celebrated *boletus* of the Romans. There are, however, two other varieties greatly resembling the orange-coloured eatable mushroom, but which are in a high degree poisonous; especially the *torminosus (piperatus* of WITHERING), which grows on the roots of birch-trees, for instance, at Haughwood near Woolhope, Herefordshire; and the *necator*, which is of a dirty yellowish cast, appears to

be composed of woolly fibres filled with a glutinous dew; and thrives in the same place, as well as in the park at Edgbaston, under large Spanish chesnut-trees.

8. The *cinnamomeus*, or Brown Mushroom, has a convex, but flatted, clothy cap; often with a central rise, in colour resembling that of a chesnut, or newly tanned leather. Its long stem is yellowish and naked, and the gills tawny red. This plant is readily distinguished by its cinnamon colour: in the months of September and October, it abounds in woods, especially in the plantations at Tettenhall, Staffordshire, and at Pendarvis, in Cornwall: it emits an agreeable odour, and, when boiled, possesses a fine flavour.

9. The *violaceus*, or Violet-coloured Mushroom, has numerous purple gills, eight in a set: the cap being of a purple or brown cast, convex, and the edge turned down; the stem is also purple and cylindrical, from $\frac{1}{4}$ to one inch in diameter, and growing from one to four inches in height.—This species remarkably varies, both in its size and tints. When full grown, the cap changes its lilac colour to a russet hue; but the gills continue nearly in the same state; hence, according to Major Velley, the latter afford a more accurate criterion, with respect to colour, than any other part of mushrooms in general.—The violet-coloured mushroom is in perfection from October to December, and is frequently found at Edgbaston and Barr Plantations, in the woods near Bath, and at Powick, near Worcester.—When thoroughly boiled and seasoned, it is asserted to be as palatable as an oyster.

We have now enumerated the principal species of mushrooms that are poisonous, as well as those which may be safely eaten; but, as their harmless, or noxious properties, in a great measure depend on the nature and situation of the soil producing them, it will always be necessary to attend to this circumstance, before they are gathered. There is no doubt but that the gills inhale the stagnant or superfluous vapours from the ground; hence, they speedily putrefy, and become the prey of worms, flies, and other insects.

In horticulture, the esculent mushrooms only are raised artificially; for this purpose, when no young plants can be procured from the fields or gardens, their roots, spawn, or embryons, may be generated from horse-dung, laid unbroken in small heaps, under cover. In a few weeks, during the summer months, fibrous roots will appear, resembling white threads, which, on separating the heaps, emit the smell of mushrooms.

The dung is directed to be carefully piled up, as entire as possible, about three inches thick, on a hot-bed of a moderate heat; and formed of alternate strata of horse-dung, and tanner's-waste; the uppermost layer being composed wholly of tan, to the thickness of two inches. The bed is next to be covered with a little manure, and to be raised about three inches, with good soil; when it is finally overspread with a thick stratum, or coat of straw.

The most proper place for the formation of mushroom-beds, is in the shed usually erected behind hot-houses; because, as these plants vegetate without light, warmth only is requisite, provided they be occasionally watered.—The French practise a method of rearing these plants, which is both simple and expeditious: they pour the water, that has been employed for washing eatable mushrooms, on the usual hot-beds, and thus a constant succession of growth is obtained, especially if the stalks be left in the ground, when their heads or caps are gathered for the table.—In China, the putrefied wood of elms and willows is forminto a bed, and covered with the leaves of these trees; the whole is then frequently watered with a weak solution of nitre. This composition produces continual crops of the most delicious *champignons*, which are collected in the manner before stated.

Mushrooms form an isthmus between the animal and vegetable kingdoms; and it is not yet ascertained, whether they can be propagated by seed. When in a state of putrefaction, they emit a cadaverous smell; and it appears from the experiments of VON HUMBOLDT, that they are equally good conductors of GALVANISM, or of the *Galvanic Fluid*, as real animal matters. He farther observes, that their participation of animal nature is evinced by chemical analysis; because mushrooms contain a remarkable portion of azote and phosphorus; and *morels* may be converted into *fat*, by means of the sulphuric acid, or oil of vitriol, diluted with water.

Considered as an article of food, mushrooms are by no means wholesome or nourishing: being tough, and greatly resembling soft leather, they are almost indigestible, and ought not to be eaten by persons of weak or inactive stomachs. Besides, many species of this numerous genus of vegetables are extremely deleterious, and cannot be accurately distinguished from such as are harmless and esculent: it would not, therefore, be attended with any *loss*, excepting to the epicure, if mushrooms were totally banished from our tables. But, if they *must be dressed*, it will be advisable to employ a large portion of vinegar, or other vegetable acids, to counteract their acrimonious and narcotic nature.—In order to ascertain, with greater certainty, whether all the plants of a collection which is destined to undergo the culinary process, be of an inoffensive nature, it will be proper to put a peeled onion in the vessel in which they are to be cooked; and, if this root acquire a blueish or dark hue, we may conclude that there doubtless are poisonous mushrooms among them. Should, however, any noxious species have been inadvertently eaten, it will be requisite to take a dose of ipecacuanha, or of the antimonial emetics, in order to eject the poison as speedily as possible; or, if the accident be discovered only after some hours have elapsed, copious draughts of vinegar and water, or oil and vinegar, will then form the most efficacious antidotes.

MUSIC, denotes the art of producing and combining sounds, in such a manner as to render them agreeable to the ear.

Music forms a pleasing recreation, and is calculated to produce the happiest effects upon the mind, or to exhilarate the animal spirits. Hence it has with the greatest advantage been employed *medicinally*; several instances having occurred, in which patients labouring under delirious fever, were calmed; and, a *critical* sleep succeeding, they were eventually cured.

This art may be likewise, beneficially practised by persons of low melancholic temperament; as, according to the nature of the tunes played, it is equally calculated to excite pity, to sooth the mind, and to rouse the social affections. But, as the principles by which these various combinations are regulated, constitute a profound and extensive science, our limits will not permit us to enter into any analysis. The curious reader will derive amusement and instruction from the perusal of Mr. KOLLMAN's *Essay on Musical Harmony* (fol. 1l. 1s. 1796); the same author's *Essay on Practical Musical Composition* (fol. 1799, 1l. 1s.), and Mr. SHIELD's *Indroduction to Harmony* (4to. Robinsons, 1800); in which the subject is scientifically discussed.—The History of Music, as well as its present state, in France, Italy, Germany, &c. has been ably treated in the voluminous publications of Dr. BURNEY, whose writings on this interesting topic possess classical merit.

MUSK, a drug resembling clotted blood, which is obtained from the musk-bearing animal *(Moschus Moschiferus,* L.) a native of the South-eastern parts of Asia, Siberia, and China: it is secreted in a small bag found beneath the lower belly of this ruminating quadruped.

Musk has a bitter, somewhat acrid, taste; and emits a fragrant odour which, at a distance, is very agreeable: the best is imported from the East, in round thin bladders, about the size of a pigeon's egg, which are covered with short brown hairs. The substance itself is dry, and consists of small, round, grains, of a reddish-brown or dark rusty colour, somewhat unctuous, but perfectly free from sand or similar adulterations.—It pays on importation, the sum of 2s. 2½d. per ounce troy; and the same duty when it is taken out for home-consumption (if sold by the East India Company), beside 2l. per cent. on its value.

This strong scented drug is greatly esteemed in the East, on account of its medicinal properties; though it has not, till lately, been employed as a perfume in Britain; and is still more rarely used as a medicine. Musk, however, appears to be possessed of considerable efficacy; especially in convulsive hiccoughs and fits, if administered in doses consisting of from eight to ten grains.—It is likewise an excellent anti-spasmodic, and has sometimes been prescribed with advantage, in slow, or nervous fevers, to the quantity of a scruple, taken three or four times in twenty-four hours.—See also GANGRENE.

With a view to caution the reader against impositions in the sale of musk, we refer him to the article BEAVER, or *Castor moscatus,* vol. i. p. 210.

ARTIFICIAL MUSK, is a chemical preparation thus denominated, on account of its possessing all the essential properties of the genuine drug. It was first invented by MAGGRAF, and has been lately recommended to public notice by Prof. HUFELAND: it is prepared in the following manner:—One dram of rectified oil of amber is first poured into a wine glass, on which a dram and a half of the concentrated nitric acid, or smoking aquafortis, should be gradually and cautiously dropped. The mixture, on agitating it, grows hot, and emits offensive vapours, against which the nostrils must be guarded: when it has stood twenty-four hours, the compound produces a yellow-resinous matter, concreting at the top; and which resembles musk in its smell, while a strong acid liquor remains at the bottom. The resin is now to be repeatedly washed, both in cold and in hot water, till it be totally divested of its sour taste. Thus a substance is obtained, which is not only cheaper than the common musk, but is at the same time free from those impurities with which the latter is too frequently adulterated.

Artificial musk is, doubtless, a more powerful medicine than the *natural*, and has been successfully prescribed by HUFELAND, in the epidemic chin-cough, as well as other nervous and spasmodic affections. Nor have its effects been less salutary in cases of *diabetes* (see URINE), and difficulty of breathing; having effected a cure when other medicines had failed of success.—As this substance is of a resinous consistence, it will be most conveniently given in emulsions: hence ten or twelve grains of it should be triturated in a mortar, together with a few blanched almonds, and diluted with five or six ounces of distilled water. Of this mixture, two tea-spoonfuls may be given every two hours, to a child between one and two years old; and in progressive doses, so that a youth from twelve to fourteen years of age, will require double, and an adult about three times the quantity above stated. Without the aid of any other medicine, it generally produces a sudorific effect; diminishes and alleviates the fits of coughing; and often produces eruptions resembling the true nettle-rash:—thus, a favourable crisis takes place, and the disease speedily disappears.

MUSLIN, a kind of fine cloth, loosely woven of the finest cotton yarn.

Formerly, all muslins were imported from India; but, at present, very considerable quantities are manufactured in Manchester, Glasgow, Paisley, &c. which, for fineness and durability, are little inferior to those of the East. It should, however, be remarked, that the British muslins acquire a yellowish cast, after they have been repeatedly washed, while the genuine India-muslins retain their original whiteness.

Plain muslins, Nankin cloths, and also flowered or stitched muslins, when imported, pay, on being deposited in the East India Company's warehouses, the sum of 7l. 10s. per cent. according to their value. They are likewise subject to a farther duty of 19l. 13s. 9d. per cent. on being taken out for home consumption.

MUSTARD, or *Sinapis*, L. a genus of plants, comprising nineteen species: three of which are natives of Britain: namely,

1. The *arvensis*. See CHARLOCK.

2. The *alba*, or WHITE MUSTARD, which grows in corn-fields, and on road-sides; it flowers in the month of August.—This species, when cultivated, thrives best in a soil that is naturally heavy, but which has been reduced to a fine mould, by tillage: it is propagated by sowing one bushel of the seed per acre, in the month of March; it should be frequently hoed; and, when the plants arrive at a proper size for transplantation, they may be set out, ten inches apart.—Mustard may be sown on the same land, for three successive years; and it always leaves the soil in suf-

ficient tilth for the reception of any other crop. Its leaves afford a grateful food to sheep, and other cattle: the seed yields from every cwt. 33 or 36lbs. of a sweet, mild oil.—Bees are remarkably attached to the flowers.—This plant is likewise raised by gardeners in the winter, and early in the spring, with a view to supply the table with salad.

3. The *nigra*, or COMMON MUSTARD, growing in corn-fields, on ditch-banks, and road-sides; flowering in the month of June.—The sauce, called *mustard*, and in daily use at our tables, is prepared from the seeds of this species, obtained by culture, and reduced to powder. They likewise afford a considerable quantity of expressed oil, which partakes but little of the acrimony of the plant.—When unbruised, they impart a very weak flavour to boiling water; but, in a pulverized state, they coagulate milk, and strongly impregnate both fluids.—If a watery infusion be taken in a considerable quantity, it operates as an emetic; but, in the proportion of a table-spoonful or two, it is a gentle laxative; in this form, it has proved of service in cases of asthma, chronic rheumatism, and palsy.—Cataplasms, prepared with crumb of bread, vinegar, and pulverized mustard-seed, are excellent stimulants, when applied to benumbed or paralytic limbs; to parts affected with fixed rheumatic pains, and to the soles of the feet, in fevers that require such treatment.—In short, mustard acts powerfully upon the nervous system, without exciting a high degree of heat: by its acrimony and pungency, it stimulates the solids, and attenuates viscid juices; so that it is deservedly recommended for exciting appetite, assisting digestion, and promoting the fluid secretions, being greatly preferable to the generality of acrid plants of the *antiscorbutic* class.

In 1798, a patent was granted to Mr. ROBERT JOHNSTON, for his contrivance of a medicine, which he calls *Improved Essence of Mustard.* The particulars of this patent are inserted in the 9th vol. of the *Repertory of Arts, &c.*

MUSTARD, the HEDGE, or *Erysimum*, L. a genus of plants, comprising ten species, four of which are natives of Britain.

1. The *officinale*, COMMON HEDGE-MUSTARD; WORM-SEED; BANK-CRESSES; or SCRAMBLING-ROCKET: it grows under walls and hedges, on road-sides, and among rubbish; where it flowers in the months of May and June.—This species possesses a warm and acrid flavour; and, when cultivated, is used as an early pot-herb. Its seeds, taken internally, promote expectoration, the discharge of urine, and other fluid secretions. The juice has been employed with unparalleled success in ulcers of the throat, and for removing hoarseness, occasioned by loud speaking.—Sheep and goats relish this species; but cows, horses, and swine refuse it.

2. The *Barbarea*, WINTER-CRESSES; WINTER-ROCKET; or ROCKET-WORMSEED; which grows on walls, in watery places, on banks of running streams, and is sometimes found in cultivated fields: it flowers from May to October.—In Sweden, the common people use the leaves of this herb in early salads in the spring, and late in the autumn: they also boil them as kale.—It is sown in Britain, to obtain spring-salad, and

eaten under the name of *French Cress*.—Cows devour this plant; but horses and swine refuse it; and it is disliked by goats and sheep.

The *Alliaria*, GARLIC HEDGE-MUSTARD, JACK-BY-THE-HEDGE, SAUCE-ALONE, or GARLIC WORMSEED, thriving on ditch-banks, in hedges, and shady places; it flowers in the month of May.—When growing in farm-yards, poultry are induced to eat this herb, which imparts to their flesh an intolerable rank taste. The Prussians eat the leaves, in the spring, with salted meat; and they are equally useful with lettuce, and the colder salads.—In Wales, it is frequently used as a frying herb.—The seeds excite sneezing.–BAUTSCH employed this herb with advantage in the process of tanning.—Cows and goats eat the plant; but horses, sheep, and swine refuse it.

4. The *cheiranthoides*, TREACLE HEDGE-MUSTARD, or TREACLE-WORMSEED, thrives in corn-fields, and on the banks of rivers; it flowers in the month of July.—The seeds of this species are, according to Dr. WITHERING, successfully used by the country people, for destroying worms.—The plant is eaten by horses, cows, goats, sheep, and swine.

MUTTON, denotes the flesh of sheep, after they have been deprived of life.

The best and most nutritive *mutton*, is that of sheep which are at least three, but not more than six years old; and which have been reared on dry, sweet pastures. The meat afforded by such as have been fed on salt-marshes, or near the sea-coast, is likewise sweet and wholesome; for they have acquired both firmness and a fine flavour, from the saline particles abounding in such situations.

The flesh of ewes, and especially of wethers that have not been kept above the age before stated, is of a rich and invigorating nature; while that of rams is not only tough and coarse, but also has a strong, unpleasant taste. Young meat abounds with sweet juices, and is easy of digestion; though, if under three years of age, it seldom attains its peculiar relish, and is generally somewhat *ropy*.

If a piece of mutton be designed for roasting, it will be advisable to expose it to the open air for several days, according to the state of the weather or season. Thus, it will afford a savoury dish, which is easily digested, and agrees with every healthy person. Mutton-fat, however, is with great difficulty converted into aliment, and ought therefore not to be eaten by invalids, or those whose organs of digestion are relaxed, or impaired by excess; as it coagulates in the stomach, and oppresses its action.

Mutton-suet dissolved in milk, or the *feet of sheep* boiled to the consistence of a jelly, afford excellent clysters, in complaints arising from an acrimony or irritability of the intestines, such as dysentery, &c.: the latter preparation, being a very nourishing dish, may also be eaten.

MYRRH, a gummy-resinous, concrete juice, obtained from a shrub growing in the East Indies, but of which we possess no certain account.

The best myrrh is somewhat transparent, of an uniform brownish, or reddish-yellow colour; of a slightly pungent, bitter taste; with a strongly aromatic, not disagreeable odour, though nauseous to the palate.

In its medicinal effects, this aromatic bitter, when taken by the mouth, is supposed to warm and strengthen the stomach and other viscera; it frequently occasions a mild diaphoresis, and, in general, promotes the fluid secretions.—Hence it has been used with advantage, in cases of debility; in diseases arising from suppression of the urine, or from immoderate discharges, in *cachetic* habits, and those persons whose lungs and throat are oppressed by viscid phlegm.—It is farther believed to resist putrefaction in all parts of the body; on which account it is highly recommended in malignant, putrid, and pestilential fevers; and in the small-pox.—For these purposes, it should be taken in doses of half a dram or upwards; and it may also be usefully combined with nitre, cream of tartar, or some other cooling salt.—Being, however, a heating and stimulating medicine; its *proper* choice requires some precaution, and ought to be directed by professional advice.

MYRTLE, or *Myrtus*, L. a genus of exotic trees, comprising forty-two species; of which the *communis*, or Common Myrtle-tree, only is cultivated in Britain. There are several varieties, known under the names of Broad-leaved Roman, Dutch, and Jew's Myrtle; orange-leaved Spanish Myrtle; the Thyme-leaved, Rosemary-leaved, Box-leaved, and Upright Italian Myrtles, &c.

All these varieties are beautiful ever-greens; which, though requiring the shelter of a green-house in the more northern parts of Britain, during the winter, vegetate most luxuriantly in the county of Cornwall, and on the southern coast, in the open air, without being sheltered from the severity of the winter.

The Common Myrtle is easily propagated by cuttings, which may be set in beds of a rich, but light soil, beneath glasses, or in a green-house, where they thrive with uncommon rapidity.—In the Island of Minorca, the young tops are employed for tanning; and the berries are eaten by the inhabitants.

In Britain, however, this species is cultivated chiefly for ornament; though it is likewise of service as a medicine. A distilled water is obtained from its leaves; which, being both detersive and astringent, is sometimes used in gargles, or as a cosmetic for fixing the teeth, when loosened by the scurvy. Its berries are distilled; and the oil they yield, is reputed to be excellent for thickening the hair; on which account it is frequently used as an ingredient in pomatums, and other cosmetics. Lastly, a decoction of the flowers and leaves is said to be of great service in fomentations.

MYRTLE, the DUTCH. See GALE the Sweet.

N.

NAILS, in anatomy, are horny lamina or plates growing over the ends of the fingers and toes of men, as likewise over the lower extremities of the inferior animals.

The nails apparently possess similar properties with the epidermis, or outward skin, being devoid of sensation; and, if the latter membrane be separated from the true skin, by any accident, the nails are likewise in danger of being removed, or materially injured.

These excrescences are divided into three parts, namely, the root, the body, or middle, and the extremity, or end. The *root* is a soft, thin, white substance, which terminates in the form of a crescent, and to which the epidermis strongly adheres: from this part, the nails increase, and derive all their nourishment. The *body*, or middle, is considerably broader, thicker, and of a deeper red than the root; while the extremity is of still greater firmness.

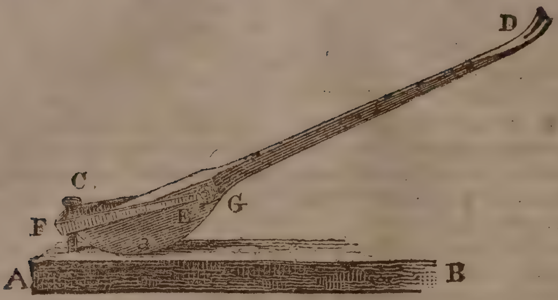
The use of the nails, in animal economy, is to defend and cover the nervous warts or papillae of the toes and fingers from external injury, when they come in contact with rugged bodies. Hence, though cleanliness require them to be occasionally *cut*, that operation ought not to be carried too far; because the sense of feeling would thus be impaired and diminished: on the other hand, they should not be suffered to grow to a considerable length; as the impurities collecting beneath them not only present a slovenly picture, but such neglect also renders the nails liable to be split and broken by various accidents.

NAILS, in building, are small pointed spikes, generally with a flat, or convex head, made of brass, iron, or other metal; which, when driven into wood, serve to connect several pieces, such as boards and laths, or to fasten a piece of timber, &c.

Nails are divided into numerous classes: their figure and size vary according to the purpose for which they are designed; and which it would be superfluous to enumerate. As they are of such essential importance in building, the arts, and economy in general, several privileges have been granted for new inventions, or improvements, in the manner of casting, or manufacturing them. On account of their ingenuity, the following patents deserve to be mentioned; namely, Mr. Finch's, obtained in 1790; Mr. Clifford's, registered in the same year; and Mr. Spencer's, granted in 1801. But, as these processes can only be understood and practised by manufacturers, we cannot enter into any detail, but refer the curious reader to the 7th, 9th, and 15th, vols. of the *Repertory of Arts*, &c.; where full specifications are inserted; and Mr. Spencer's patent is illustrated with an engraving.

NAIL and BOLT-DRAWER.

In the year 1787, the *Society for the Encouragement of Arts*, &c. conferred a bounty of three guineas on Mr. William Rich, of Yalding, Kent, for his invention of a machine, which is represented in the following cut, in the action of drawing out a spike.



A, B, the piece of timber, in which the nail or spike C, intended to be drawn, is inserted.

D, E, the shape of the tool, consisting of a lever, D, that moves on a solid basis, in the form of a segment of a circle, as at E.

F, a square staple, turning on a centre at G: and, if the spike to be drawn, be held between the lever and the staple, any pressure at D, will act with an effect proportionate to the distance *a* F, and D *a*; and the workman will thus be enabled to exert a very great force against the spike C.

Mr. Rich's nail-drawer is both simple and ingenious; it is eminently serviceable in breaking up ships, and on other occasions, where large nails and spikes have been driven deeply into wood, from which they are to be extracted.

Nail-wort. See Whitlow-grass the Common.

Naphtha. See Bitumens.

NARCOTICS, a term comprehending opiates, anodynes, or paregorics, and all other drugs which induce sleep, or occasion stupefaction.

The narcotics chiefly employed in medicine are, opium, henbane, hemlock, &c. respecting which the reader will, in the order of the alphabet, find a concise account of the cases in which they may be used with advantage.

Whatever tends to induce stupor, ought to be carefully avoided, or at least very cautiously administered, in disorders of the stomach and intestines; for no other class of drugs is productive of such pernicious consequences to the nervous system. If taken in very small doses, narcotics at first excite and increase the action of the nerves, while they produce gentle undulations of the circulating blood; but, in a larger proportion, they stimulate, and at length reduce or debilitate, all the nervous and muscular functions. Thus, their consequent effect is similar to that of *wine*, which, if used in moderation, promotes a temporary activity, by invigorating the nervous power, or rather, by causing an additional motion (which in physic is called *congestion*) of the fluids towards the head; but, when drunk too freely, it weakens and stupifies all the sensitive organs, by the unusual pressure it causes on the brain. Hence it will be readily inferred, that such *heroic* remedies can be prescribed with safety, by those only who are acquainted with the animal economy.

NAUSEA, or Sickness, denotes a propensity and exertion to vomit, which may be induced by various causes, such as apoplexy, fevers, violent pain, crude aliment, indigestion, diseases of the liver, &c. but especially by any local irritation of the digestive organs.

This affection, though disagreeable, is often very serviceable, by relieving the stomach when overloaded with incongruous matter, and by promoting expectoration in cases where the lungs are oppressed with mucus or phlegm. Farther, it often induces sensible perspiration, and contributes to the proper distribution of the fluids throughout the body: hence, nausea has proved to be an excellent remedy in various complaints, where it was artificially excited, by the smallest doses of emetics. In some cases, however, it is injurious to the patient, especially when too violent, or too frequently repeated; as it is apt to debilitate the stomach; so that, in consequence of the necessary exertions, the patient becomes exhausted, and is apt to be afflicted with ruptures or other maladies.

Pregnant women are particularly subject to nausea and vomiting, which, if they be not timely mitigated, are productive of the most serious consequences. With a view to afford some relief in those distressing situations, Dr. Marcard recommends the use of *acidulated mineral waters*, especially those of Sedlitz. The water of pure ammonia, or caustic vegetable alkali, has lately been prescribed with success by Dr. John Sims, who has often found it eminently useful in cases where acidity prevails, such as heart-burn, cough upon taking food, and other complaints of pregnancy. This judicious practitioner directed twenty drops of the pure ammonia to be taken in a glass of water, from which the patient experienced immediate relief.

Navew. See Rape, or Cole-seed Cabbage, vol. i. p. 417.

Nealing. See Annealing.

NECK, in animal economy, that part of the body which is placed between the head and the thorax, or chest.

As the description of the different veins, vertebræ, &c. that compose this part of the human frame, is the province of anatomy, we shall here give a few hints relative to those diseases or injuries, to which the neck is peculiarly liable.

1. The *wry neck.* — This deformity arises from various causes; being sometimes born with persons, though more generally induced by a preternatural contraction of one side of the neck; a relaxation of one part, while the other retains its usual power, &c.

If the distortion be natural, there is little probability of obtaining relief by art; but, if it arise from contraction of the skin, occasioned by burns, the repeated use of oils, ointments, and emollient fomentations, will relax the rigidity of the fibres. In some instances, it will be advisable to restore the natural posture of the head by means of a steel collar, or other contrivance in which the neck may be supported, till it resume its proper position. Should these exertions, however, fail to prove useful, surgical assistance must not be neglected; as delay may be attended with danger.

2. *Tumors.* See Wens.

3. *Luxations* of the neck are in general fatal; though, if a partial dislocation take place, it may by proper attention be restored to its natural position. As, however, the treatment in this case is wholly chirurgical, we shall not enter into

detail.—Let it be observed that, till proper assistance can be procured, the patient ought to keep himself as quietly as possible; to avoid speaking, and not to indulge in any passions; for the consequences of either may prove fatal.

NECTARINE, a variety of the common peach-tree, from which it differs only in having a smoother rind, and firmer pulp.

There are several varieties of this fruit, known under the different names of Scarlet, Newington, Roman Nectarines, &c.; but, as their properties and culture are similar to those of the PEACH, we propose to give a concise account of them under that article.

NEEDLE, the COMMON SHEPHERD'S, VENUS-COMB, CRAKE-NEEDLE, or NEEDLE-CHERVIL, *Scandix Pecten*, L. an indigenous plant, growing in corn-fields, and flowering in the months of June and July.—This weed frequently infests corn-fields, and may be eaten as greens, being a wholesome vegetable.—When bruised with marsh-mallows, these two herbs are said to afford an excellent application to fresh wounds, especially with a view to promote the extraction of splinters.

NEEDLE-FURZE, PETTY WHIN, or NEEDLE GREENWEED, *Genista anglica*, L. an indigenous plant, growing on heaths, and moist spongy ground: it flowers in the months of May and June.—DAMBOURNEY made experiments with the branches, as well as the leaves and flowers of this plant, which produced a dye of a fine citron colour: the prepared wool acquired in the decoction a very pure yellow tint.

NEGUS, a well-known compound beverage, prepared of one part of Port-wine, and two parts of water, to which is usually added a small quantity of sugar, lemon-peel, &c.

This liquor is salubrious and harmless, especially if the juice of a Seville-orange be substituted for that of lemons.—As the peel of the last mentioned fruit, however, contains a considerable quantity of highly inflammable and volatile oil, negus becomes more stimulating than pure wine, if it be used in large quantities; but, if moderately taken, it may contribute to strengthen the stomach. It should, however, be remembered, that asthmatic patients, or those who are subject to diseases of the breast, ought carefully to abstain from this and similar drink; an indulgence in which, may be productive of the worst consequences; as the heating oil, together with the fumes of wine, is too powerful a stimulus to their organs of breathing.

NEP. See CATMINT.

NERVE, in anatomy, denotes certain white, round, delicate substances, similar to cords, which proceed from the brain or spinal marrow, and are divided into numerous smaller fibres or branches, that are dispersed throughout the body.

The nerves have been supposed to contain a very subtle fluid, which may be either of a magnetic or electrical nature; and though the nervous fibrils, when examined with the microscope, appear to be solid bodies, yet they probably conduct a very subtle fluid by means of their interstices. Thus, they are the immediate instruments of sensation, and are indispensably necessary for the continuance of muscular motion.

Wounds are the chief accidents

to which the nerves are liable; but as the former require immediate chirurgical assistance, we shall only remark, that the nerves of several animals are larger than those of man; though, possessing a very inferior degree of sensation. Indeed, the mental capacities of beings are by no means proportioned to the size of their nerves, proceeding from the brain:—amphibious animals, for instance, possess strong nerves, in proportion to the diminutive size of their brain; and are nevertheless uncommonly dull of apprehension, and even insensible. On the contrary, children affected with the rickets, and persons of lean habits, have a large brain, and very delicate nerves; yet they possess not only a high degree of mental vigour, but likewise uncommon acuteness in the perceptions of sense.

Nervous diseases are supposed to arise from an increased sensibility of the nerves, under the influence of some stimulus; and are principally distinguished by their predominant *painful* symptoms; for instance, violent head-ach, tooth-ach, face-ach, &c. Hence the absurdity of classing almost every complaint, the origin of which is not obvious, among the *nervous*, and to misapply this term to disorders of a very different nature, such as general weakness, occasioned by muscular relaxation, or mental imbecility, peevishness, want of resolution, &c. if connected with bodily causes, however distant or concealed.

NETTLE, or *Urtica*, L. a genus of plants, comprising 57 species, three of which are natives of Britain; namely,

1. The *urens*, or Lesser Stinging Nettle, which is frequent on rubbish and cultivated lands; it flowers from July to September.—The leaves of this species, according to Linnæus, are gathered and cut to pieces, in order to be mixed with the food of young turkies:—the whole plant is refused by every kind of cattle, and ought therefore to be carefully extirpated from pastures.

2. The *dioica*, or Common Nettle, grows on ditch-banks, and among rubbish; it flowers in the month of July. This species has a square, firm stem, three or four feet high, with long-pointed, serrated leaves, that are furnished with stings, having at their base small vesicles full of a corrosive liquor; and which, on being touched, excite a blister, accompanied with a burning and painful sensation.

The Common Nettle, though generally considered as a noxious weed, is of extensive utility: its young tops may be boiled during the spring, and eaten as a substitute for greens; being not only nourishing, but mildly aperient. In the Western Islands of Scotland, a rennet is prepared, by adding a quart of salt to three pints of a strong decoction of nettles; a table-spoonful of which is said to be sufficient to coagulate a bowl of milk. —The leaves are employed for feeding poultry; and especially in the winter, when boiled, they promote the laying of eggs:—in a fresh state, they are refused by horses, sheep, goats, cows, and hogs; though asses devour them eagerly. When *dry*, they are eaten by cows, for which they are an excellent food, increasing the quantity, and improving the quality, of their milk:—According to M. VAN GEUNS, such fodder is an effectual preservative against the contagious distemper affecting horned cattle.

The roots of the Common Nettle, when boiled, communicate a yellow tinge to yarn. But the most valuable part, is its fibrous stalk or stem; which, on being dressed in a manner similar to flax or hemp, has, in some parts of Europe, been advantageously manufactured into cloth. This useful branch of industry has also been attempted in Britain, and a coarse kind of durable canvas was produced, which is considerably harder than the cloth manufactured from hemp or flax. As, however, this plant requires a rich soil to obtain it in any quantity, and, as a much greater degree of attention and accuracy is necessary in the operation of *rating*, than is requisite either for flax or hemp, Dr. ANDERSON is of opinion, that the cultivation of the nettle will be attended with difficulty.—From the rind, as well as the woody substance of the stalk, Dr. SCHAEFFER has produced a very good white writing paper; though that manufactured by M. DE VILLETTE, in France, was of a dark-green colour.—The seeds, on expression, afford an useful lamp-oil.

In a medicinal view, the whole plant, and particularly the root, is esteemed to be *diuretic*; and has, therefore, been recommended in the jaundice and in nephritic complaints.—A leaf, if placed on the tongue, and pressed against the roof of the mouth, is said to be efficacious in bleeding at the nose; and instances have occurred, in which paralytic limbs have been recovered by stinging them with nettles. If credit be due to some authors, the expressed juice of this plant is a valuable remedy to the asthmatic and consumptive.

3. The *pilulifera*, or ROMAN NETTLE, growing among rubbish, and on old walls. It is found chiefly in the vicinity of Yarmouth, and on the eastern coast of England; it flowers in the month of August.

Both the last mentioned species possess similar properties; and, as the Common Nettle, in particular, acquires the height of six feet, when sown in September or October, on an indifferent soil, FUNKE strongly recommends its culture; nay, he maintains, that after the second year of its growth, it thrives rapidly, reproduces itself annually, and may be mown two or three times every year. In this respect, it promises to become an excellent fodder for cattle.

NETTLE-HEMP, or *Galeopsis*, L. a genus of native plants, consisting of four species, the principal of which is the *Tetrahit*, Common Hemp-nettle, or Nettle-hemp All-heal. It grows in hedges, corn-fields, and among rubbish; flowers in the months of July and August.—In Thuringia, the small seeds of this plant are collected by the poor, and not only sold in considerable quantities as food for birds, but their sweet-oil likewise is expressed; as it affords an excellent supply for chamber-lamps. Hence, BECHSTEIN advises the cultivation of this vegetable, chiefly on account of its mild salad-oil, which the seeds yield in a large proportion.

NETTLE-RASH, or *Urticaria*, a cutaneous disease, thus denominated, from the resemblance of the eruption to that produced by the stinging of nettles. Numerous pimples appear on the skin, often suddenly after rubbing or scratching it; though they generally vanish in a few hours, and sometimes in a few minutes.

The nettle-rash affects some persons only for one or two hours; others for a few days; while in some it continues for several months, and even years. It more commonly attacks females than males, and children oftener than adults; but is not infectious.

The cause of the nettle-rash is ascribed, by Dr. HEBERDEN, to some mechanical object, applied to the skin, such as COWHAGE, or the spiculæ of cantharides adhering after the removal of blisters; though the disorder may be induced by eating muscles, lobsters, shrimps, and even honey, as likewise from partaking of fish not sufficiently dressed, or of fresh pork, &c. so that the foundation of it appears to be laid in the organs of digestion, which prepare a coarse chyle, consequently crude and acrid fluids. From whatever cause this affection may arise, Dr. H. conceives that it does not corrupt the humours, so as to require *internal* remedies: he is of opinion that, if the itching could be speedily mitigated, no farther medicine would be necessary. For this purpose, a mixture of oil, vinegar, and spirit of wine, may be applied to the skin, and will afford a temporary relief; though Prof. STARCK, of Jena, believes this eruption (when it is of a *periodical* or *chronic* nature) to originate from a diseased viscus or intestine; and therefore prescribes, first, sudorifics and diuretics, then resolvent and strengthening medicines; but especially the copious use of Seltzer-water.

NEWSPAPERS, are certain publications, which appear daily, weekly, or at other stated periods of the week, in order to communicate the most important political, domestic, or literary information.

The first English newspapers were published in the year 1642, since which time they have been greatly increased, so that now several millions of copies are circulated every year.—Independently of their utility as vehicles of general intelligence, these prints certainly contribute to disseminate useful knowledge of a very diversified nature: and, so long as they are conducted with the strictest adherence to truth and decorum, they may be justly considered as a *national benefit*. If, however, a contrary conduct is pursued, and newspapers are made subservient to the sordid views and intrigues of a party, they not only disgrace their ostensible editors, conductors, or proprietors, but are highly prejudicial to the interests of society; inasmuch as they become the records of falsehood, either by propagating, and often enlarging upon calumnious reports, or by misrepresenting matters so as to exhibit both the object and the subject of the *paragraph* in an odious light; or, by perpetuating national prejudices and animosities; or, lastly, by displaying their ignorance of the geographical and political situation of other countries connected with the British empire.

As it is not our intention to undertake the ungrateful task of pointing out the different *ministerial* and *opposition prints*, or to draw the line between those which are more or less *authentic* in their sources of information, we shall merely enumerate the different newspapers at present published in the United Kingdom.

English Country Papers:

At Birmingham, 2; Bristol, 5; Bath, 3; Bury, 1; Blackburn, 1; Cambridge, 2; Canterbury, 2; Carlisle, 1; Chelmsford, 1; Chester, 2; *County Chronicle*, and *Herald* (eighty miles round London), 2; Coventry, 1; Cumberland, 1; Derby, 1; Dorchester, 1; Doncaster, 1; Essex, 1; Exeter, 2; Gloucester, 1; Hampshire, 1; Hull, 2; Hereford, 1; Ipswich, 1; Lancaster, 1; Leeds, 2; Liverpool, 3; Leicester, 1; Lynn, 1; Manchester, 3; Maidstone, 1; Newcastle, 3; Northampton, 1; Norfolk, 1; Norwich, 1; Nottingham, 1; Oxford, 1; Portsmouth, 2; Reading, 1; *Sussex Advertiser*, 1; (Sussex, Hants, Surrey, and Kent); Sherborne, 1; Salisbury, 1; Sheffield, 1; Shrewsbury, 2; Stamford, 1; *Staffordshire Advertiser*, 1; Worcester, 2; and York, 3.

Scotch Papers.

At Aberdeen, 1; Dumfries, 1; Edinburgh, 8; Glasgow 3; and at Kelso, 2.

Irish Papers.

At Athlone, 1; Belfast, 1; Cork, 3; Clare, 1; Clonmell, 1; Dublin, 9; Drogheda, 1; Ennis, 1; Kerry, 1; Limerick, 2; Leinster, 1; Londonderry, 1; Sligo, 1; Strabane, 1; Waterford, 1; and Wexford, 1.

London Papers.

EVERY MORNING—Morning Post; Morning Chronicle; Morning Advertiser; Morning Herald; Oracle and Daily Advertiser; Public Ledger; Times; and True Briton.

EVERY EVENING—Courier; Star; Sun; and Traveller.

EVERY TUESDAY, THURSDAY, and SATURDAY EVENING—Commercial Chronicle; English Chronicle; General Evening Post; London Evening Post; Express and Herald; London Chronicle; St. James's Chronicle; and Whitehall Evening Post.

EVERY MONDAY, WEDNESDAY, and FRIDAY EVENING—Evening Mail; London Packet; and Lloyd's Evening Post.

EVERY WEDNESDAY—Weekly Register.

EVERY TUESDAY and SATURDAY—London Gazette (by authority).

EVERY TUESDAY and FRIDAY—Courier de Londres.

EVERY THIRD SATURDAY in the MONTH—Hue and Cry (Police Gazette).

EVERY SATURDAY—Baldwin's Journal; Mirror of the Times; Old British Spy; Say's Craftsman; and Westminster Journal.

EVERY SUNDAY—Bell's Messenger; Monitor; Observer; Recorder and Reformer; Review; Selector; and Dispatch.

From this enumeration it appears, that in the United Kingdom, there are not less than 153 distinct Newspapers, of which 72 are published in the different counties of England, 39 in the Metropolis, 15 in Scotland, and 27 in Ireland.

NICKEL, a semi-metal, the use of which has hitherto been very limited. It is rarely found, and almost exclusively in cobalt-mines. The regulus of nickel is, in the ore mineralized with sulphur, and mixed with iron, cobalt, and arsenic: when dissolved in acids, it affords green crystals; by means of the fixed vegetable alkali, it produces yellow; and by the volatile alkali, blue solutions.

This semi-metal can with great difficulty be fused with other metals. We understand, however, from a foreign writer, that the Chinese, by the addition of nickel, prepare their *white copper*, which is an elegant composition, and may be applied in the arts, to many useful purposes.

NICKING. See HORSE, vol. ii. p. 484.

NIGHTINGALE, or *Motacilla lucinia*, L. a small bird, remarkable for the melody of its notes: the feathers of the head, neck, and back, are sallow; the wings and tail brighter than the rest of its body; and the whole creature weighs scarcely one ounce.

Nightingales are birds of passage, probably from Asia, visiting Britain in the beginning of April, and returning to the warmer climates in August;—they never unite in flocks, and their habitations are generally at a distance from each other. The female constructs her nest in low bushes or quickset hedges, well covered with foliage, in the vicinity of brooks; it is externally composed of dry leaves, mixed with grass and fibres, and lined with hair or down: here she deposits four or five olive-green eggs. During the period of incubation, the females alone sit on the eggs, while the males in the vicinity, in a manner emulate with their melodious songs; but they cease to exert their powerful voice as soon as the young are hatched, when they assist in feeding their nestlings.

There are two varieties of this bird, namely, those with a larger and longer body, which sing only at night; and others which are smaller, of a colour inclining to a red shade, and warble more frequently during day-light. Sometimes also, they are of a whitish cast, but rarely met with in our climate.

Nightingales are often reared from the nest; though old birds, by proper management, may be taught to bear confinement, and to vie in their song with the young ones. As they cannot endure cold, their cages should, in the winter season, be suspended in a warm place; for otherwise they cannot be preserved alive.

The proper food for nightingales is, spiders, wood-lice, ants-eggs, flies, and worms; as their diet, in general, agrees with them better, when mixed with animal food. These birds are subject to various diseases, which, according to some ornithologists, may be averted by giving them, in the month of March, one black spider every day, for six days in succession.

NIGHT-MARE, or *Incubus*, a singular affection, occasioned by a spasmodic state either of the lungs or the abdomen; by a redundancy of blood, or a partial stagnation, in its passage through the heart and the pulmonary vessels.

During this affection, the patient perceives, or imagines that he feels, an uncommon oppression in the region of the breast and stomach, which no effort can remove. Sometimes he groans, and screams, but more frequently in vain endeavours to speak. At other times, he fancies himself struggling with an enemy, or with demons; to be in a house that is in flames; or in danger of being drowned, &c. so that the terror induced by the frightful ideas which accompany these uneasy sensations, causes a tingling in the ears, and produces a general tremor.

The night-mare chiefly attacks nervous, hypochondriac, or delicate persons, when lying on their back: beside the causes above stated, it may, in many instances, be assigned to *indigestion.* Hence persons of sedentary habits and weak nerves, especially those who are subject to flatulency, ought carefully to avoid all coarse and heavy nutriment; to eat light but nourishing food; to abstain from late, or *solid* suppers; and lastly, to raise their heads in bed tolerably high. As those who are attacked with the night-mare generally groan when labouring under a fit, it will be requisite to address or *wake* them instantly, as the uneasiness will thus be greatly removed. Should, however, the paroxysm continue to increase, it will be useful to administer small, but frequent doses of valerian, asafœtida, or other anti-spasmodics, and to strengthen the body with the mildest chalybeates. But if young persons of plethoric habits be subject to this affection, it will be advisable to use a spare diet, to take daily exercise in the open air, and to attend to the state of the bowels, in order to prevent costiveness.

NIGHTSHADE, or *Solanum*, L. a genus of plants, comprising 66 species; of which only two are natives of Britain; namely,

1. The *Dulcamara*, BITTER-SWEET, or WOODY-NIGHTSHADE, growing in moist brakes, hedges, and on the sides of cold brooks and ditches, where it flowers in the months of June and July. It endures ten years in the same soil, and attains, in the shade, the height of seven feet; but, if there be no shrubs in their vicinity, the shoots creep along the ground, and frequently strike *new roots.* On account of their depth, the plant is uncommonly useful towards consolidating dams and banks of rivers.—BOERHAAVE informs us, that the bitter-sweet is far superior to sarsaparilla;—and, according to LINNÆUS, an infusion of the young twigs is eminently serviceable in acute rheumatisms, inflammations, fevers, &c. It has also been found very efficacious in cases of asthma, jaundice, and of the scurvy; for which purposes, Dr. HALLENBERG directs a pint of boiling water to be poured upon two drams of the stalks, previously sliced and dried; after standing half an hour, the whole must be boiled for about fifteen minutes. The dose is two tea-cupfuls, or more, in the morning and evening. The stalks may be gathered early in the spring, or late in autumn;—in smell, the root of this vegetable resembles that of the potatoe.—Its beautiful red berries have a disagreeable taste, and possess deleterious properties.—Sheep and goats eat the dulcamara, but horses, cows, and swine refuse it.

2. The *nigrum*, COMMON NIGHTSHADE, or GARDEN NIGHTSHADE; which grows among rubbish, on dung-hills, and in kitchen gardens: it flowers from June to October.—Though generally considered as a poisonous weed, the Dalmatians fry it in butter, and eat this dish with a view to procure a comfortable sleep; an effect which the writer of these pages had occasion to witness.—From one to three grains of the leaves, infused in boiling water, and taken at bed-time, induce a copious perspiration, increase the secretion of urine, and generally operate as a laxative on the following day. Hence this simple preparation, if judiciously

administered, may prove of great service in several affections; but its influence on the nerves is too precarious to admit of its use, without professional advice.—The leaves, externally applied, abate inflammation and assuage pain; the flowers possess the odour of musk.—The whole plant is refused by every kind of cattle.

NIGHTSHADE, the Deadly, Dway-berries, or Deadly Dwale; the *Atropa Belladonna*, L. indigenous plant, growing in hedges, among lime-stone and rubbish; it flowers in the month of June or July.—The whole of this plant is poisonous; and children, allured by the beautiful appearance of its berries, have too often experienced their fatal effects.—The most proper antidotes, in such accidents, are strong emetics, large draughts of oil and vinegar, purgatives, blisters applied to the neck; and, after the poison has been ejected from the stomach, the tincture of castor in small doses of 10 or 15 drops, should be diluted in a spoonful of water, and taken every two or three hours.—It is asserted, that tumors of the breasts, even of the cancerous kind, have been resolved by a local application of the fresh leaves. A poultice prepared of the roots, boiled in milk, and applied to hard ill-conditioned ulcers, has sometimes effected a cure.—Although the internal use of this medicine, and its great efficacy in the most obstinate diseases, such as hydrophobia, epilepsy, melancholy, madness, and the distemper of cattle, is attested by many eminent continental writers, yet we do not advise our readers to venture upon a remedy so powerful and dangerous in its effects.—The juice of the berries, when ripe, imparts to paper a beautiful and durable purple.—Sheep, rabbits, and hogs, eat the leaves of the Deadly Nightshade without the least injury; nay, experience has evinced, that the last mentioned animals have, by the use of this herb alone, been effectually cured of the inflammatory distemper, to which they are subject in dry seasons.

NIPPLE, a small prominence arising from the middle of the female breast. The lacteal tubes terminate in these projections, through which the milk is drawn in the act of sucking.

The nipples of females, when suckling their first child, are frequently so diminutive and deep within the breast, as to render it difficult or impracticable for the infant to extract the milk. In such cases, the young mother should frequently, though cautiously, protrude the nipple between her fingers, by depressing the projecting part of the breast; and afterwards covering the protuberances with an excavated nutmeg, to be worn several weeks previously to her delivery. But, if this expedient prove insufficient, it will be advisable to draw the breasts, either by presenting them to a *healthy infant*, several months old; or, by applying Mr. Savigny's small air-pump contrived for that purpose; and which is far preferable to the common breast-glasses, as well as to the disgusting practice of employing quadrupeds.

Another inconvenience incident to nipples, frequently arises from chaps, or excoriations. These are not only painful to the mother, but also prevent the infant from drawing the necessary supply of milk. In some instances, even part of the substance of the nipple is destroyed by violent suction; so that the mother, from the intense pain thus occasioned, is obliged to refuse the breast; and a stagnation of the milk takes place, which is often accompanied with ulcerations and fever. To prevent such dangerous affections, the practice of raising the nipples, as before suggested, should be timely adopted; but, if the parts be already in a diseased state, it will then be useful to bathe them with lime-water, or diluted port-wine; after which the nipple should be dressed with a little spermaceti-ointment. Before, however, such applications are resorted to, it will be preferable to anoint the sore part with a composition of white wax and olive-oil, and to cover it with a fine linen rag; by which simple means great relief may often be obtained.

These remedies will, in general, be found sufficient; but, if the nipple receive no benefit, it has been recommended to apply the neck, together with part of the body, of a hog's bladder (or cow's teat taken from a healthy animal), to the part affected. Either of these, if properly moistened and fixed to the breast, will effectually protect it, while the infant is sucking; and, when not in use, the bladder or teat may be preserved in a little spirit of wine, which will prevent it from putrefying.—See also Thrush.

NIPPLE-WORT, or *Lapsana*, L. a genus of plants, comprising five species; one of which is indigenous, namely, the *communis*, Common Nipple-wort, or Dock Cresses. It grows in hedges, shady places, and on rubbish; where it flowers in the months of June and July.—The young and tender leaves of this vegetable have the flavour of radishes, and may be eaten raw, as salad. Though possessing a bitter taste, they are a wholesome vegetable; and, in some parts of England, the country people boil them as a substitute for greens.

NITRE, or Salt-petre, is a species of salt, which, in Persia and the East Indies, is extracted from certain native earths. It is likewise artificially produced in several parts of Germany, Hungary, and especially in France; either from the rubbish of old clay-walls and ceilings, or from animal and vegetable matters suffered to undergo putrefaction, which is promoted by the addition of ashes and of lime; when the whole is exposed for a considerable time to the access of the air, in a direction from north to south.

Nitre is of a sharp, bitterish, penetrating taste, followed by a sensation of coldness. When pure, it dissolves in about six times its weight of water, and, on evaporating the latter, concretes into transparent crystals. It easily melts in the fire; where it deflagrates with a bright flame, accompanied with a crackling noise, and afterwards deposits a large portion of alkaline earth.

Salt-petre is of great utility both in the arts and in medicine. Its spirit, known under the name of Aqua-fortis, is extensively employed both in dyeing, and in refining, as well as for other purposes, the principal of which we have already stated.

Purified nitre is prescribed with advantage in numerous disorders: it is usually given in doses of from two or three grains to a scruple; being a very cooling and resolvent medicine, which, by relaxing the spasmodic rigidity of the vessels, promotes not only the secretion of urine, but at the same time insensible perspiration, in febrile disorders; while it allays thirst, and abates heat; though in malignant cases, in which the pulse is low, and the patient's strength exhausted, it produces contrary effects.

When combined with the Peruvian bark, nitre affords an useful corrective to that drug in the cure of spreading gangrenes; as it prevents the additional heat which the bark frequently occasions: so that the efficacy of the latter is increased by the antiseptic quality of the former. But this cooling salt should never be administered in cases where the violence of the fever depends on bilious or putrid impurities in the abdomen; and where the patient is subject to hemorrhages or fluxes of blood, arising from a vitiated state of the fluids. On the contrary, salt-petre will be most beneficially used in acute rheumatisms, inflammatory fevers, and even in those hemorrhages arising from congestions of the blood in general, or from a plethoric state.

With respect to the antiseptic properties of nitre, in domestic economy, we refer to the articles Beef; Butter (vol. i. p. 405); Pickling; and Pork.

Nits (in Horses). See Stavesacre.

Nonsuch. See Trefoil Medick.

NOSE, in anatomy, the external organ of smelling, or that part which projects from the middle of the human face.

The nose is subject to various affections, such as ulcers, luxations, fractures, &c. the treatment of which is foreign to our purpose: and, as we have already discussed the subject of hemorrhages, under the article Bleeding, we refer the reader to p. 283 of our first volume.

If the nose of an infant be obstructed with any gross matter, so as to impede respiration, or to prevent him from sucking or swallowing, it will be advisable, every evening to anoint the part with a little sweet-oil, or fresh butter. By this simple application, the gross particles will in most instances be dissolved, and the faculty of breathing speedily restored.—Should, however, the obstructions continue after the repeated use of this remedy, it will be necessary first to administer one or two gentle laxatives; such as a tea-spoonful of castor-oil, or a grain of rhubarb; after which the nose is to be frequently bathed with a linen rag, dipped in a filtred solution of two or three grains of white vitriol, in one ounce of marjoram-water.

NOSTRILS, are two apertures or cavities of the nose, through which the air passes, and which serve to convey odours, and to carry off the pituitous matter separated in the sinus of the base of the cranium. These apertures are divided from each other by a cartilage: they are lined with a very sensible membrane, and answer the conjoint purposes of smelling, respiration, and speech.

The nostrils are, in some individuals, preternaturally closed, either in consequence of various kinds of sores; or from injudicious treatment during the small-pox; though this defect has sometimes been observed in new-born children.—From whatever cause it may originate, relief can be obtained only by a chirurgical operation: and, on discovering the nostril, by enlarging

ing the incision with a furrowed probe. The apertures must next be *dressed*, and kept of a proper size, by introducing dossils of lint, which ought to be frequently changed.

As the delicate membrane which lines the nostrils, is the common integument of the mouth, and other interior vessels, it will be readily conceived, that its exposure to sudden changes of temperature, must be productive of injurious consequences. Hence the necessity of guarding against *cold*, when hastily leaving the fire-side for encountering the frosty air of winter, or returning from the latter to a heated room. Although the frequent colds and catarrhs are generally considered as trivial, and too often neglected, yet we are persuaded, that by far the greater number of consumptive and asthmatic sufferers date the period of their declining health from such inattention. We therefore recommend to those who are yet susceptible of advice, previously to exposing themselves to a damp, cold, or sharp air, to spend a few minutes in a cool, temperate room, or to apply a handkerchief to the mouth, when suddenly coming in contact with the external air, till they become gradually accustomed to its stimulus. Thus, we doubt not, many complaints of serious consequences, might be easily prevented.

NOSTRUM, denotes any medicine the composition of which is supposed to be secret, and confined to the knowledge of one, or a few individuals.

The natural desire of health and longevity, has in all ages afforded a pretext to designing men, to invent medicines, with the absurd view of curing *every* disorder. It is true, that the confidence in *panaceas*, or universal remedies, is gradually declining, among the higher as well as the lower classes of society; but innumerable elixirs, drops, pills, &c. for particular complaints, are daily imposed upon the public by pretenders, whose chemical and medical knowledge is so confined, that they are generally obliged to borrow the recipes for such preparations from printed books. To aggravate the evil, their pernicious compounds for the most part contain opium, hemlock, or other narcotic drugs, which are rendered still more deleterious by the addition of stimulating gums and aromatic substances.

The duration and extent of such base practices, it is difficult to determine; though we conceive that, so long as the thoughtless and dissipated indulge in sensual pleasure of every description, the audacity of pretenders to the healing art will continue to increase. Experience has too often evinced, how little efficacy *medicines* possess in a variety of cases, without a strict adherence to a proper *regimen*; and much less may be expected from any nostrum, however strongly recommended by the dignitaries of church and state. Nay, the excellence and dignity of medical science can neither be supported, nor depreciated, by the illusion of great names.—If a due regard were more generally had to the laws of temperance and sobriety; if the cool dictates of reason were more frequently consulted, there would be fewer diseases, and those who enrich themselves at the expence of a credulous public, would speedily

dily be compelled to pursue occupations less fraudulent, and more beneficial to the community.

NOVEL, a fictitious history, written with a view to exhibit the emotions of the human heart; the happiness and misery of private life; the effects of indulging the passions, and especially that of LOVE.

The origin of modern novel-writing, together with the requisites essential to an interesting work, we leave to the discussion of the critic. There are, indeed, too many publications of this nature; but the generality of such performances, instead of inspiring the young mind with a love of virtue, and a detestation of vice, are only calculated to excite the most insidious and sensual ideas: hence we think it our duty to caution parents, with respect to the purity of such compositions as may fall into the hands of their unguarded children.

As the design of novels or romances is to interest the human heart, they are too apt to lead it astray, unless written in a chaste and correct style. Numberless are the victims of delusion, especially in the metropolis, whose wretched state commenced with the indiscriminate perusal of seductive novels. Nor is this evil confined to the middle ranks of society, in cities, or to boarding-schools. The farm-house, and the cottage, in many parts of England, furnish subscribers to circulating libraries, at the distance of several miles from the town or village, where the most absurd, and frequently immoral narratives (provided they be handsomely printed), are eagerly read, and dignified with the title of a "Novel."

By these brief strictures, we by no means intend to proscribe the dissemination of knowledge, particularly among the lower classes. —There undoubtedly are novels (though few in number), which deserve to be perused by inexperienced youth, and which reflect credit on their authors. Such "familiar histories," in the opinion of the late Dr. JOHNSON, "may perhaps be made of greater use than the solemnities of professed morality, and convey the knowledge of vice and virtue with more efficacy, than axioms and definitions. But, if the power of example be so great as to take possession of the memory by a kind of violence, and produce effects almost without the intervention of the will, care ought to be taken, that, when the *choice* is unrestrained, the best examples only should be exhibited; and that what is likely to operate so strongly, should not be mischievous or *uncertain* in its effects."

NOURISHMENT, in animal economy, denotes the reparation of the continual waste which bodies undergo in consequence of exercise, the effects of air, hunger, thirst, sleep, &c.

Nutriment is afforded by proper food containing alimentary juices; and which, after due mastication, is digested in the stomach, converted into chyle, incorporated with the blood, and thus distributed throughout the body for its support. In young persons, the nutritious juices not only contribute to restore the continual waste, but also to increase their size, which is denominated *growth*. In adults, likewise, the epidermis, or scarf-skin, though continually peeling off, is always renewed; and, if any muscular parts be separated from the body, they are speedily supplied with new substance: in a similar manner, wounds heal spontaneously; and such persons as are emaciated or exhausted, again grow plump, and even become lusty.—See DIGESTION and FOOD.

NURSE, a woman who professes to rear young children, or to attend sick persons.

The duties incumbent on nurses, whether intended for the management of infants, or of patients, are equally important. Hence the utmost precaution is requisite to select such as are *cleanly*, in good health, and uncontaminated by any latent disease, especially if they be destined to suckle children: for, it is a melancholy truth, that the hopes of many families have sunk into an early grave, after they had intrusted their offspring to nurses, who were tainted with the scurvy, or other fatal disorder. Such vigilance, therefore, ought not to be relaxed, even though proper persons have been procured; because there are many, who, from selfish and superstitious motives, will not hesitate to use the most hurtful means of lulling the child to sleep: thus, the innocent babe is early inured to the taste of *spirits*, which it retains even at a maturer age, and insensibly becomes the most detestable of characters, a *drunkard*. To prevent these and similar abuses, we would seriously advise all parents to visit their children, not merely on Sundays, but as often as their time will permit on other days of the week; as these unexpected calls will enable them easily to ascertain, either the propriety, or mal-practices, in the conduct of those persons to whom they may have committed the care of their children.

With respect to *sick-nurses*, we cannot omit to observe, that they ought to be *cleanly*, and *warmly* clad. If they are obliged to attend their patients during the night, it would be advisable (especially in dangerous cases, and where the expences can be afforded) always to employ *two* nurses, so that the one may relieve the other; and the afflicted may receive that prompt attention, which many of those mercenary hirelings unwillingly bestow. Indolence and slight, however, are not the only evils, to which the unresisting patient is often doomed to submit. During the destructive plague, which depopulated this metropolis in the reign of CHARLES II. the merciless miscreants who had the charge of the infected, not only plundered them while expiring, but even terminated their existence by violence, and had the audacity to attribute their decease to the malignance of the distemper!

The mind shudders with horror at the recollection of such atrocious crimes, and is tempted to hope, for the sake of humanity, that such outcasts of society no longer exist. But, alas! instances have repeatedly and lately occurred, in which the cap has been removed, and a better one substituted; nay, the rings were torn out of the patient's ears, while in the agonies of death. The finest linen has been found on the bed, damp and un-aired, being the nurse's perquisite, when her hapless victim is no more; and other cruelties have been committed, the enumeration of which would shock the feelings of the most phlegmatic reader.

Although it is painful to record atrocities which degrade human nature, yet they cannot be too generally known, that all persons may be rendered vigilant in the selection of those who are appointed to attend the sick. It is not, however, our intention to insinuate, that all nurses are thus depraved. There may, doubtless, be found persons whose humanity and attention to the diseased, render them worthy of the greatest commendation; but the safety and welfare of society seems to require, that proper measures be taken, to prevent the repetition of such enormities for the future: and we trust, that considerable benefit would result from an institution, the object of which should be the appointment of proper nurses; so that none be permitted to perform that important office, unless provided with a certificate, signed by three or more medical practitioners.

NURSERY, in horticulture, a piece of land selected for raising or propagating plants and trees, with a view to supply both gardens and plantations.

As we state, under distinct heads, the mode of cultivation to be adopted in the rearing of plants, both when in the nursery, and also after their removal to the spot where they are intended to remain, we shall at present communicate a few general hints and directions.

I. A nursery ought to be situated contiguously to the dwelling-house, that it may be conveniently inspected in every season: it should likewise be in the vicinity of a brook, or rivulet, in order that there may be a constant supply of water, during the hot days of summer.

II. If it be intended for timber-trees, MILLER advises the nursery to be formed on the ground which is designed for the future plantation, so that a sufficient number may be suffered to stand, when the others have been removed.

III. The ground appropriated to *flowers*, ought to be exposed to the south, but at the same time sheltered from strong winds, either by means of trees, or of buildings.—The soil should be light and dry, especially for bulbous-rooted plants.

IV. With respect to *fruit-trees*: 1. The soil ought to be fresh, rather dry than moist, and not richer than that into which they are finally to be transplanted. 2. It should be carefully inclosed, to exclude hares, rabbits, and all other animals that infest young plantations; after which the ground must be diligently cleared from all weeds, and *trenched* to the depth of about two feet, in the month of August, so that the nursery may be ready for the reception of the young stocks, in October. 3. On the approach of the planting season, the trenches must be filled up, the soil be laid as level as possible, and divided into equal quarters, which ought likewise to be subdivided into beds, wherein may be sown the seeds or stones of the fruit intended to be reared.—Lastly, when a sufficient number of *stocks* is obtained, they must be removed into such soils, and exposed to such situations, as the nature of each fruit may require.

NURSERY, in domestic life, denotes an apartment devoted exclusively to the rearing and accommodation of children.

The room designed for this purpose ought to be lofty, perfectly dry, and in the attic story of the house, or at least above the ground-floor. Another requisite to nurseries is, that they be spacious and airy;

airy, so that their young inhabitants may have sufficient room to exercise themselves, when the inclemency of the weather prevents them from partaking of the benefit of the open air. Too many windows, however, afford too strong a light for infantine eyes, and the rays of the sun are, to their weak organs, not less hurtful than close walls, and dark apartments.

Cleanliness ought particularly to be attended to; and every care should be taken to render the air of nurseries perfectly dry and pure. Whatever tends to corrupt the atmosphere, must therefore be studiously avoided. No damp linen, or swaddling clothes, should be washed, or suspended for drying in such apartments; nor should any provisions, especially animal food, be cooked there; for all these processes vitiate the atmosphere, and produce exhalations which are highly injurious to the eyes of infants; frequently occasioning chronic inflammations in those organs. The nursery ought, likewise, to be carefully swept every day, while the children should be removed at least into another room, if the weather prevent them from making excursions abroad.

Lastly, in case the air of the nursery has become corrupted by accident, the windows should be frequently opened, to promote its purification, by the influence of the fresh atmosphere, which is far preferable to fumigations with frankincense, or similar aromatics; for, though such perfumes dissipate the offensive smell for the moment, they introduce a stupefying vapour that is extremely hurtful, especially if the children be descended from weakly parents.

NUTMEG-TREE, or *Myristica moschata*, L. an exotic plant growing in India; resembling in size and growth the common cherry-tree; and bearing fruit throughout the year.

Nutmegs have long been employed both for culinary and medicinal purposes. On distilling them, one pound of this fruit affords, according to Gleditsch, only four or five drams of essential oil, which possesses the flavour of the spice itself. An inspissated decoction produces an extract of an unctuous, slightly bitterish taste, which is somewhat astringent. Rectified spirit extracts the whole virtue of nutmegs by infusion. When heated, this spice likewise yields by expression a large portion of a limpid yellow oil, namely, four or five ounces from every pound; and which, on cooling, concretes into a soapy consistence.

In the Island of Banda, the whole fruit of the nutmeg-tree is preserved, by boiling it first in water, and afterwards in syrup; or by pickling it in brine, vinegar, &c. in a manner similar to walnuts.

With respect to their effects on the human body, nutmegs are strongly aromatic, stomachic, and astringent: hence this drug has often been used for diarrhœas and dysenteries, in doses from 10 to 20 grains in powder, or in larger quantities, when infused in Port-wine. In violent head-achs, arising from a debilitated stomach, *small doses* of this medicine have frequently been found of real service; but, if injudiciously employed, it is apt to affect the head, not unlike opium and other powerful narcotics.—The officinal preparations of nutmeg are, a spirit, and an essential oil: the nutmeg in substance is also roasted, to render it more astringent.—See MACE.

NUTRITION. See NOURISHMENT; and FOOD of Plants, vol. ii. p. 320.

NUX VOMICA, a flat, compressed, round fruit, about an inch in diameter, of a greyish-brown colour, of a horny consistence; and the surface of which is somewhat wrinkled. It is the produce of a tree growing in the East Indies; possesses a bitter taste; and has been found a certain poison for dogs, cats, fish, &c. Nevertheless, this highly deleterious fruit has lately been employed on the Continent, as a medicine of great efficacy, in spasmodic affections of the bowels, especially in the contagious dysentery, as well as in obstinate quartan agues, &c. But, as its administration can be directed only by professional men, we forbear to mention the proper doses, and shall only observe, that the London brewers have frequently been suspected of adulterating their ale and porter with this narcotic drug, in order to render them more intoxicating; though such charge has, to our knowledge, never been proved in a court of justice.

NYMPH (in Botany) See CHRYSALIS.

O.

OAK, or *Quercus*, L. a genus of plants, consisting of 29 species, two of which, according to Dr. WITHERING, are indigenous. The principal of these is the *Robur*, or Common Oak, found in various parts of Britain, where it flowers in the month of April.

The oak thrives better in hilly than in boggy ground, but flourishes most luxuriantly on rich black soils, or in strong moist loams; and, while it is young, in large plantations. It is propagated generally by sowing acorns in the proportion of from four to six bushels per acre, together with some white-thorn berries, and seeds of furze or whins; both to shelter the young plants from the severity of the cold winds, and also to protect them from being devoured by hares, rabbits, &c. As they advance in size, the stronger saplins should be selected to stand, while the more weakly are occasionally cut down; because the roots of the oak strike deeply into the ground, and the tree will not always grow with equal energy, if it be removed from its primitive soil. Nevertheless, very young oaks may be transplanted two, and even three times, provided the tap or principal root be cut off at every removal; though such trees will be neither so *full at heart*, compact, and strong, nor so lasting as those which are suffered to stand on the spot where the seed was originally deposited.

This tree is remarkable for the slowness of its growth, its great bulk, and longevity. It has been observed, that the trunk attains, in general, only fourteen inches in diameter, in the course of eighty years. But, after arriving at a certain age, its *bulk* rapidly increases: thus, the trunk of an oak, belonging to Lord POWIS, and growing in Bromfield wood, near Ludlow, in Shropshire, measured in 1764, *sixty-eight* feet in girth, and twenty-three feet in length; containing in the whole 1455 feet of timber, round measure, or twenty-nine loads and five feet, each load consisting of 50 feet. And Dr. DARWIN mentions the *Swilcar Oak,* a very large tree growing in Needwood forest, which measures *thirteen* yards in circumference at its base, *eleven* yards round, at the height of four feet from the earth, and which is believed to be *six hundred* years old.

The oak is one of the most valuable and majestic trees: its leaves are eaten by horses, cows, goats, and sheep;—deer and swine fatten on the acorns. Its bark, when stripped off, is usefully employed for tanning leather, and afterwards for hot-beds and fuel. It should not, however, exceed the age of 40 or 50 years, as after that time it becomes *corky,* and does not answer the purpose of the tanner.

Oak-timber is well adapted to almost every purpose of rural and domestic economy, particularly for staves, laths, and spokes of wheels. Being hard, tough, tolerably flexible, and not very liable to *splinter,* it is generally preferred to all other timber for building ships of war; especially if the tree be suffered to stand for three or four years after it has been *barked*: because it thus becomes perfectly dry, and the inspissated sap renders it much stronger than the heart of any other oak-tree, which has not been stripped; so that the timber acquires greater strength, weight, hardness, and durability.

As this tree is of such eminent utility in naval architecture, and cannot be *bent* without great difficulty, Mr. RANDALL, of Maidstone, in Kent, proposed, in 1795, to the Society for the Encouragement of Arts, &c. a method of training oaks to *compass-shapes,* for the purpose of ship-building. His plan consists in reversing the practice usually followed, in order to obtain *strait-stemmed trees*; by taking off, every year, in the months of March and June, all the lateral shoots closely to the stem, commencing when the tree is about eight feet high, and continuing the operation every year, till it has attained the height of 20 feet. In consequence of this management, the oak grows somewhat crooked, and the curvature will increase as the tree advances in years.

This part of his plan, Mr. RANDALL considers to be particularly applicable to parks, hedge-rows, or open plantations. The other part of his suggestion relates to forests, in which the underwood is regularly cut every fifteenth or twentieth year, and where many clean and thriving young oaks are often discovered. If two of these grow so near as to reach each other by inflexion, he proposes to bend down their heads, by means of a hooked stick, and to join them together, by interweaving their respective branches; in consequence of which, the trees will assume a direction that will greatly facilitate the future labour of the ship-builder. The proper time for performing these operations is from the age of eight to fourteen years, if the oaks grow freely; and the most convenient season for interweaving the branches, is in the spring, before the leaf appears.—

Although we cannot enter into farther details, relative to this method of promoting the growth of compass-timber, yet we trust the plan is sufficiently obvious and practicable, to be generally adopted: the curious reader is therefore referred to the 13th vol. of the Transactions of the patriotic Society above mentioned.

The saw-dust, and even the leaves, though inferior to the bark, have been found useful in tanning. It appears, from numerous experiments made by the Rev. Mr. SWAYNE, of Puckle-church, near Bristol, and recorded in the 10th vol. of the *Transactions of the Society for the Encouragement of Arts, &c.* that half a peck of oak-leaves contains nearly as much astringent matter as one pound of bark.—Farther, the leaves make excellent hot-beds, and the saw-dust is the principal indigenous vegetable used in this country, for tinging fustians of various brown colours.

The GALLS, or excrescences, produced on the leaves, are employed for dyeing, and various other purposes, already stated in p. 355, of our 2d volume.—The balls, or apples, growing on this tree, are sometimes substituted for the galls, in dyeing black colours, with the addition of copperas; but these shades, though more beautiful, are by no means of equal durability to those obtained from the former.—Lastly, the juice, express'd from oak-apples, when mixed with vitriol and gum arabic, will make an excellent black ink.

With respect to the medicinal properties of the oak, its bark is a powerful astringent, whence it has often been used with advantage in hæmorrhages, alvine fluxes, and other immoderate secretions.

Beside the common oak, so generally known and cultivated, there is an exotic species, which has lately been recommended to public attention by Mr. CHARLES WHITE, in the 5th vol. of the *Memoirs of the Literary and Philosophical Society of Manchester*. This species is there called the *Iron*, *Wainscot*, or *Turkey Oak*, and is stated to be a non-descript variety of the *Quercus Cerris*, or smaller prickly-cupped Spanish Oak, or that which Mr. AITON (in his *Hortus Kewensis)*, terms the *frondosa*.—The Iron Oak grows to a considerable height, producing a bulky trunk, and widely spreading head, with large oblong-oval, deeply-serrated leaves, and acorns of an unusual size, in capacious prickly cups:—from these circumstances, we believe it rather to be the species denominated *Ægilops*, or Large Prickly-cupped SpanishOak; which grows not only in Spain, but also in Turkey (whence the *Iron* kind was originally brought to England), and corresponds in every other respect to the Iron or Wainscot Oak.

This valuable species is propagated in a similar manner with the common British Oak, which it fully equals in hardness, and weight, while it excels in growth or size, as will appear from the following comparative statement:

	Height.			*Girth.*	
	Feet.	*In.*		*Feet.*	*In.*
An Iron Oak, 20 years old, measured -	36	0	—	3	3
Another of the same age - - -	37	0	—	3	0
An English Oak, 20 years old - -	28	0	—	2	6
Another 40 years of age - - -	39	0	—	2	10

Our limits will not permit us to enter into an analysis of Mr. WHITE's Memoir; we shall, therefore, only observe that the species now recommended, will thrive much faster than the common Oak in a similar situation; and that, as it carries up the thickness of its *buts* much higher, they contain *five* or *six times* the quantity of wood, found in the English species. —The Wainscot Oak has hitherto been employed only in making posts, pales, &c.; but it appears from Mr. W.'s observations, that it promises to be equally useful as the British trees, for every purpose of ship-building or of carpentry.

OAT, or *Avena*, L. a genus of plants, comprising 33 species, of which the following are the principal: and the six first mentioned are natives of Britain; namely,

I. The *nuda*, NAKED OAT, PILCORN, or PILLS, growing wild in some parts of Staffordshire, and flowering in the month of July.—This species is cultivated in the county of Cornwall; where, in the time of RAY, it was sold at the price of wheat. It is reputed to be nearly as good as the common oat; for it yields excellent meal; is equally useful in feeding cattle; and thrives on the poorest lands.

II. The *elatior* (*Holcus avenaceus* of Dr. SMITH), TALL OAT-GRASS, or OAT, thrives on wet, damp soils; in meadows, pastures, and hollow ways; it flowers in the months of June and July.—This grass vegetates with uncommon luxuriance; and, though somewhat coarse, it makes tolerably good hay. It is eaten by cows, goats, and sheep, but is frequently very troublesome in arable lands; as its roots spread in a manner similar to couch-grass, and are very difficult to be eradicated.

III. The *fatua*, BEARDED WILD OATS, HOVER, or HAVER, is found in corn-fields, where it flowers in the month of July or August.—This species is eaten by horses, sheep, and goats: it is a pernicious weed in corn-fields, particularly among barley, where it is sometimes so prevalent, that it almost entirely choaks the growth of the latter. It may be extirpated by repeated fallowing, or by laying the land down to grass.

IV. The *pubescens*, ROUGH OAT, DOWNY OAT-GRASS, or HAIRY OAT-GRASS, which grows on dry meadows, in chalky situations, and flowers in the month of June. It is refused by every species of cattle; and, on account of its roughness, does not deserve to be cultivated.

V. The *flavescens*, YELLOW OAT, or OAT-GRASS, thrives in meadows, pastures, and on hills, in a calcareous soil, and flowers in the months of June and July.—This species, though tolerably sweet, is inferior to the meadow and fescue-grasses. Dr. WITHERING observes, that cattle do not relish it, but Mr. SWAYNE states it to be one of the best of this genus, for the use of the farmer.

VI. The *pratensis*, MEADOW OAT, or NARROW-LEAVED OAT-GRASS, is likewise a native of Britain, growing on heaths, and high calcareous lands; flowering in the month of July.—This species is a tolerably good pasture-grass, and particularly calculated for poor stony soils; as it prospers, where the meadow-grasses will not vegetate.

VII. The *sativa*, or COMMON OAT, thrives on almost any soil; and, being extremely productive on land newly broken up, it is eminently adapted to cold mountains, or marshy ground. It is divided into three varieties, namely:

1. The *White Oats*, which are the most valuable, and require a soil somewhat drier than that for the other species: this variety is chiefly cultivated in the southern counties of Britain.

2. The *Black Oats*, which are principally raised in the northern parts of this island:—for feeding cattle, they are of equal quality to the white oats; though not affording so sweet a meal for culinary purposes, as the latter.

3. The *Brown*, or *Red Oat*, produces good meal; ripens somewhat earlier than either of the two preceding varieties, and does not shed its seed. It is chiefly cultivated in the north-western parts of England, for the feeding of cattle.

All these varieties are propagated by seed, which may be sown from the middle of February to the beginning of June, in the proportion of from three to six bushels per acre, broadcast; though sometimes with the addition of 12lbs. of clover, and one bushel of ray-grass. The seed is harrowed in; and the management of this kind of grain does not materially differ from that of barley, rye, &c. Oats have, in the south of Britain, been both dibbled and drilled; but, as this new practice has been attempted only by a few farmers, the success has not been completely ascertained; though there is little doubt but that either method, if judiciously conducted, is preferable to the broadcast system.

The last-mentioned species is raised on account of its farinaceous properties. The grain is given to horses, for which it affords a very strengthening food; and, before barley came into general cultivation, it was converted into malt.

The meal is, in North Britain, made into cakes, biscuits, &c.; or it is boiled into a kind of pottage. Lastly, its soft straw is usefully employed in feeding cattle, when mixed with potatoes; and likewise for packing glass and earthen-ware.

Beside the three varieties into which the common oat is divided, there are two others, which have originated from them, namely:

1. The *Peebles-oat*, is a variety of the red-oat, and which was first cultivated in the Scotch county of that name. It is peculiarly calculated for mountainous districts, as it not only ripens early, but also withstands the severity of the wind, and is not easily shaken. Its grains, though smaller than those of any other oat, have a very thin hull, and yield an unusual proportion of fine, wholesome meal.

2. The *Angus-oat*, which has in a similar manner been denominated from the county of Angus, in Scotland; and is a variety of the white-oat, but produces a *better-bodied* grain, together with a greater quantity of straw; and is thus eminently adapted to poor, dry soils. It attains to maturity somewhat later in the season than its original common white kind.

VIII. The *stipiformis*, or SKEGS, is an exotic grain, that flourishes on the poorest soils, and is propagated by sowing it in the proportion of two Winchester bushels per acre. The crops produced by this species, generally amount to double the quantity of other oats; though in weight they are only equal.—Skegs is reputed to afford a remarkable sweet and wholesome food for horses, and cows, especially when given them together with the straw; as likewise for ewes, before they drop their lambs, whether allowed in the straw, or chopped; which latter method, however, is more economical.

IX. The *Tartarian*, or REED-OAT, is conjectured to be a species unnoticed by LINNÆUS. It appears to be well calculated for land that has been exhausted by an injudicious rotation of crops, and will also thrive on a stiff soil, where the common white-oat does not prosper. Its grain is much inferior to the generality of oats: nor does it ripen so early, or afford an equal proportion of meal; but its straw is very luxuriant, and the grain is not easily scattered by the wind.

X. The *Friesland*, and *Poland-oats*, which have received their names from those respective countries, are chiefly distinguished by their coming early to maturity. They, however, thrive only on the richest soils; easily shed their grain, when ripe; and afford a very indifferent meal, though they sometimes yield an astonishing increase. The quantity usually sown is, seven or eight bushels of the Poland, or six of the Friesland-oats, per acre, in the month of March or April:—these species are chiefly consumed in feeding horses.

There is a variety of the Poland grain, first raised in Scotland, and which is called *Church's-oat.* It is greatly esteemed in Northumberland, as being the best of the earlier sorts, hitherto known, for sowing on loamy lands in good condition. This variety is very productive, and ripens early: it is known by the grains being remarkably short, round, plump, and well filled: it yields an excellent meal, and is easily converted into flour.

Oats are subject to the *smut*, and various other diseases, and also to the depredations of numerous insects, in common with wheat, barley, &c. (see vol. i. p. 171, and vol. ii. pp. 65, 66); but they are most materially injured by a kind of grub, which peculiarly attacks them. This pernicious insect comes into existence, if the autumn has been warm, toward the end of October; and progressively increases in size till the beginning of winter; during which it continues stationary, without being injured by the most intense cold. Toward the end of February, the grub recommences its devastations, and gradually becomes larger till early in May, when it is more than an inch long, and one-third of an inch in circumference. At this period, it commits the greatest depredations, cutting, in a very short time, through the strongest stalks of grain.

In the summer, the oat-grub undergoes similar transformations with the caterpillar. While in its reptile state, this pernicious insect is almost invulnerable, and the fly is equally hardy. The only period, when it is susceptible of injury, is during its passage from the state of a grub to that of a chrysalis, about the end of May, or early in June, at which time rain and cold weather equally accelerate its destruction. And, as considerable quantities of rain fall during those months, almost the whole race perishes, excepting such as may have settled in soft, dry mole-hills, or on the coarse noxious weeds vegetating at the sides of ditches; and the seeds of which are wafted into the contiguous fields, whither the eggs of the grubs are conveyed.

These destructive insects appear every year, but chiefly in wet situations;

tions: they are more or less numerous, according to the heat or cold of the former season. Were it not, indeed, for the vernal showers, which fall at the period above mentioned, such devastations would be irreparable. Nor has any better method of destroying them been discovered, than to clear every hedge and ditch of all coarse, rough weeds, and herbage; for, as the latter afford shelter to the insects during the winter, they annually send forth a fresh stock, which neither fallowing nor any other attention can exterminate: thus, the soil is constantly infested with them, and much labour and expence are incurred, that might, with a little diligence on the part of the farmer, be effectually saved.

All the species of oats are very hardy plants; and, as we have already observed, will flourish on almost every soil. Their strong roots, striking to a considerable depth, open the earth, and thus, when ploughed in, loosen it for other vegetables. But, though the general practice is to sow oats between the months of February and June, yet they may be advantageously committed to the ground late in autumn, especially in mountainous situations; for they will thus not only ripen earlier, but will be enabled to resist the violence of the equinoxial winds. Farther, it appears that *unripe* seed (namely, such grain as may have been cut before it was fully ripe, in consequence of the approach of frost), if carefully dried, will, on being sown in drills, yield as good crops as corn that has attained to its full maturity. This practice has been successfully proved by Mr. DUCKETT; and, as it may be applied to *wheat*, it promises to be attended with the greatest advantage to farmers in exposed situations; as they may thus make use of their ripe grain for flour, while the thin corn will serve for seed.

When deprived of their husks, and formed into groats, oats are converted into an excellent dish for the infirm and diseased. When ground into meal, and boiled in water, they afford a thick and nourishing mucilage, which, with the addition of a few currants, is very wholesome, and produces a mildly laxative effect.

OCHRE, in natural history, a genus of argillaceous earths, slightly coherent, and composed of fine, smooth, particles, rough to the touch, and readily diffusible in water.

Ochres are of various colours, such as yellow, red, blue, brown, green, &c.: they possess virtues somewhat similar to the calces of iron, and are principally employed as pigments.

ODOUR, is that property of bodies by which they affect the sense of smell at a distance, whether in a pleasant or disagreeable manner.

It has been ascertained by numberless observations, that every species of animals, as well as of diseases, emits a peculiar odour; which, however, can be distinguished only by the most refined sense. The American Indians are able to ascertain, by smell, the proximity, or distance, of their enemies; and whether they are white men or black. Anatomists have lately discovered, that this astonishing acuteness of smelling must be attributed to the uncommon size of the nostrils, which are much dilated among these nations. The faculty of distinguishing odours, doubtless has great influence upon the morals and on the disposition of the mind; hence ROUSSEAU justly terms it "the sense of imagination." VIREY, a modern French writer, has devoted a particular treatise to the inquiry into the great effect of this sense, on the passion of love; and, in another paper, he examines the odours exhaled by living animals.—The celebrated Monk of Prague, was a remarkable instance of having preserved all the vigour and natural extent of his sense of smelling in the midst of society: thus, it is said, he could not only distinguish every person, but even ascertain the respective purity of female manners; and it is much to be regretted, that death prevented him from finishing a Treatise on Odours.

Having already, on different occasions, stated the effects of strongly odoriferous substances on the human body, we shall in this place communicate an observation which may, perhaps, at some future period, be applied to very useful purposes in the healing art. M. PREVOST, an ingenious Frenchman, has lately discovered *a method of rendering the exhalations of odorous bodies visible.* This remarkable phenomenon was re-produced before the National Institute at Paris, by various experiments, that are equally simple and striking.—A few drops of water, are to be distributed at equal distances from each other, on the surface of a glazed plate, or looking glass.—Next, the odorous substance, for instance, a piece of camphor, is placed in the middle: among other effects, the water immediately retreats to a considerable distance, in a circle, from the exhaling body, so that the intermediate space becomes perfectly dry. In proportion to the strength of the smell, this interval will be more or less considerable, and thus serve as a measure or scale for ascertaining the intensity of the odour.

OESOPHAGUS. See GULLET.

OIL, an inflammable, unctuous fluid, drawn from various natural bodies, belonging either to the mineral, animal, or vegetable kingdoms of Nature.

I. MINERAL OIL is that fluid denominated *petroleum*, or *naphtha*, of which we have already treated, under the article BITUMENS.

II. ANIMAL OILS are obtained by distillation from the fat of animals, together with their volatile salts. They may also be procured from certain animal matters, by boiling and expression. Such are the train and spermaceti oils extracted from whales, porpoises, and other fish.

This class of oils is chiefly consumed in lamps; and, as they are apt to become rancid, various means have been devised to edulcorate, or restore them to their natural state. Among the most easy expedients, are those contrived by Mr. DOSSIE, and published some years since by the Society for the Encouragement of Arts: they deserve to be more generally known:

1. Let one ounce of chalk, finely pulverized, and half an ounce of lime, slacked by exposure to the air, be put into a gallon of fetid oil; after which they must be carefully stirred, and half a pint of water gradually mixed. The stirring is to be repeated after an hour has elapsed, and at other convenient intervals, for two or three successive days. At the end of that time, a pint and a half of water, in which an ounce of salt has been previously dissolved, is to be incorpo-

rated with the ingredients in a similar manner, and the agitation occasionally renewed for one or two days. The whole is then suffered to stand at rest, when the water and chalk will be precipitated, and the oil will be considerably purified, though not so completely as by the following process:

2. Let an ounce of pulverized chalk be added to a gallon of crude, fetid oil, or to a similar quantity of the fluid prepared as above directed, and the whole be repeatedly stirred, as before described. After it has been mixed for several hours, one ounce of pearl-ashes, dissolved in four ounces of water, is to be added, and the stirring continued, at intervals, for some hours; when a solution of two ounces of salt, in one pint of water, must be added, and the agitation occasionally repeated during the next two days.—Now, the mixture ought to stand for several days, when the brine will separate from the oil, which will be greatly improved both in smell and colour. Should a greater degree of purity be required, the proportion of pearl-ashes ought to be increased; and the period intervening between the addition of the salt and water prolonged: lastly, if the same operation be repeated, and the quantity of ingredients be reduced one-half each time, the oil may be brought to a very light colour, and its smell rendered equally sweet as the common spermaceti.—By this treatment, the coarsest cod, or seal-oil, may be made to burn; and, though it be too putrid for use, it may be so far corrected by the first process, as to be in all respects equal to that commonly sold.

In the year 1798, a patent was granted to Mr. COLLIER, for a chemical process for freeing fish-oils from their impurities, in point of smell, taste, and colour; and also for improved strainers for oils and other liquids, &c. The whole is performed in the following manner: first, the patentee pours any quantity of fish-oil, or a mixture of different kinds of oil, into a vessel, which is heated to the temperature of 110 or 120 degrees of Fahrenheit's thermometer; when a portion of caustic mineral alkali is added, the weight of which is equal to four parts to the hundred of the oil. The mixture is next agitated; and, after the sediment and salt have subsided, it is drawn off into another vessel, containing a sufficient quantity of finely pulverized, fresh-burnt charcoal, and a small proportion of diluted sulphuric acid. The agitation is repeated; and, when the coal, together with the saline and aqueous particles, have subsided, the oil is passed through certain strainers, and thus rendered perfectly transparent and fit for use.—Such is the patentee's process; but, as a description of the vessels employed in edulcorating the oil, would be unintelligible, without the aid of an engraving, the reader will consult the 10th volume of the *Repertory of Arts*, &c.; where the patent is fully described, and illustrated with a plate.

Beside its utility for lamps, animal oil possesses a valuable property which deserves attention. If one drop be laid on a bug, fly, wasp, or earwig, it will cause the immediate death of those troublesome vermin; and, even when it is damaged, it may, according to Mr. BUCKNALL, be advantageously applied to fruit-trees, about a month after they have been washed with soap-suds, in order to eradicate *moss*.

III. VEGETABLE OILS are procured either by expression, infusion, or distillation.

1. Those by expression are obtained from the seed, leaves, fruit, and bark of plants; which, being pounded in a mortar, the oil is forced out by means of a press, without the aid of heat. Such are the oils of olives, almonds, beechmast, rape, and linseed.

2. In essential oils procured by infusion or decoction, the virtues of some particular plant are extracted. To this kind belong the oils of roses, chamomile, &c.; which, however, ought to be boiled only so long as there remains any aqueous moisture; for otherwise they will become black.

3. Other essential oils of vegetables are prepared by distillation, only from those plants, or parts of plants, that possess a considerable odour. They contain the fragrance, warmth, pungency, and often the active powers of the substance, from which they are drawn; whence they have received the name of *essences*, or *essential oils*; for instance, those of cloves, cinnamon, &c.—See ESSENCE.

As many of these oils are expensive, and frequently adulterated with alkohol, or with expressed and inferior essential oils, we shall point out a few methods by which such practices may be detected.

1. If there be reason to suspect that an essence is sophisticated with *alkohol*, or rectified spirit of wine, it will be advisable to pour a few drops into a glass of pure water; and, if it be actually a base mixture, the whole will now become *milky*; and, on repeatedly agitating the glass, all the spirituous part will be absorbed by the water, while the genuine oil will float on the surface.

2. If the adulteration be effected by the aid of an *expressed* oil, the fraud may be discovered, by simply adding a little spirit of wine to a few drops of the suspected oil, and shaking them together: for the spirit will dissolve all the essence, or that obtained by distillation, while the expressed oil will not be in the least affected.

3. Lastly, if an essential oil should have been mixed with a cheaper or inferior essence (which is usually effected by distilling oil of turpentine with the herbs from which the essential oil is drawn), the imposition will speedily and spontaneously appear. But there is a more expeditious mode of detecting it; namely, by dipping a piece of rag, or paper, into the suspected essence, and holding it before the fire; when the grateful fragrance of the plant will be volatilized, and the scent of the turpentine will remain.

On the properties or virtues of essential oils, we cannot enter in this place; for, as they correspond with those of the substances from which they are obtained, the reader will, in particular instances, resort to their alphabetical series—.See also MENSTRUUM.

OINTMENT, a preparation consisting of certain unctuous matters, whether animal or vegetable, for the cure of sores, burns, ulcers, and tumors.

Ointments differ from plasters only in their consistence: those prepared of animal fat appear to be more congenial to the human system, than such as are compounded with vegetable oils; though the former are more liable to become rancid by long keeping, and ought, therefore, to be applied when in a fresh state.

In the preparation of ointments, the fat and resinous substances ought first to be melted in a gentle heat, over which they should be carefully stirred, when such dry ingredients as may be necessary (being finely pulverized), must be gradually sprinkled in; till, on diminishing the heat, the mixture become stiff.

Simple Ointment consists of five parts of olive-oil, and two parts of white-wax, thoroughly incorporated.

Ointment of Hog's-lard is prepared by triturating two pounds of hog's-lard with three ounces of rose-water, till they are perfectly mixed. The whole should now be melted over a moderate fire, and suffered to subside, when the lard must be poured off, and constantly stirred, till it become cold.

Both these ointments may be used for softening the skin, and healing chaps. The former, however, being of a more uniform consistence, is preferable to the latter: but too large a quantity of either ought not to be prepared at one time; because, when they have been kept for some months, or even a few weeks, they lose their healing properties.

Van Mons has devised a new, and less troublesome, method of compounding ointments and plasters, in which fresh herbs, or their expressed juices, are employed as ingredients. The vegetable sap ought previously to be strained, and deprived of all feculent matters: next it is placed over a very moderate fire, in a shallow earthen vessel, where it is evaporated nearly to dryness: this coagulated extract is now baked or dried in an oven, so that it may be reduced to powder; in which state it is again exposed to the fire, together with the fat or oil intended for its vehicle, till the humidity is completely evaporated.—For a cheap and useful *family ointment*, see Burns, vol. i. p. 398.

Old-age. See Longevity.

OLIBANUM, a gummy-resinous substance, obtained from the *Juniperus lycia*, L.—It is imported from the Levant, or the East Indies; consisting of drops or tears, resembling those of Mastich, though rather larger: they are of a pale-yellowish, and sometimes reddish-colour, possess a moderately warm pungent taste, and a strong, though not agreeable smell.

Olibanum consists of about equal parts of gummy and resinous matters; the former of which are soluble in water, and the latter in rectified spirit.

Many virtues were formerly attributed to this drug, which it does not really possess. According to Riverius, however, it is highly serviceable in pleurisies, especially those of the epidemic kind; for which purpose, he directs a scooped apple to be filled with a drachm of olibanum, then covered and roasted under the ashes; this is to be taken for a dose, with three ounces of carduus water, and the patient to be covered up warm in bed: thus, in a short time, either a profuse perspiration, or a gentle diarrhœa ensues, and the disease in consequence disappears.

OLIVE-TREE, or *Olea*, L. a genus of plants, consisting of six species, the principal of which is the *Europæa*, or Common Olive-tree.—It is a native of the Southern parts of Europe, especially Italy, France, Spain, and Portugal, where it is cultivated to a very considerable extent, on account of its fruit, from which the *sweet* or *salad-oil* is extracted; and which also, when pickled, forms an article of food. This tree, however, produces no fruit in Britain, even in hot-houses, and as it is planted only in the gardens of the curious, we shall confine our account to the properties of olives, and to the oil obtained from them.

Olives possess, in their natural state, an acrid, bitter, and extremely disagreeable taste; which, however, is considerably improved when this fruit is pickled. The Lucca olives being smaller than any other, have the weakest taste; the larger ones, imported from Spain, are the strongest; but the most esteemed are the olives of Provence, which are of a middling size, and not so strong as those of Spain.—On account of the great quantity of oil they contain, all these varieties, if eaten by persons of delicate habits, are extremely hurtful, especially if taken by way of dessert, after a solid or heavy dinner.—Olives pay, on importation, the sum of 1l. 18s. 9½d. per hogshead of 63 gallons.

As an article of food, *olive-oil* is preferable to animal fat; but it ought always to be mild, fresh, and of a sweet taste. It should not, however, be eaten by persons of weak stomachs; for, even in its mildest state, it produces rancidity and acrimony, which are extremely injurious to digestion.—Olive-oil is chiefly used in salads, and should always be consumed together with a large portion of bread, or with the addition of sugar, on account of its richness; as otherwise it requires a powerful and active bile to assimilate it to alimentary matter. It pays on importation the sum of 7l. 7s. 9½d. per tun of 252 gallons.

Medicinally considered, olive-oil has lately been found an excellent preventive of the plague, when rubbed over the whole body immediately after the contagion is supposed to have taken place.—It is also beneficially employed internally for *recent* colds, coughs, hoarseness, &c. whether mixed with water into an emulsion, by means of alkalies, or with conserves or syrups into a *linctus*.—Lastly, considerable quantities are used in the preparation of plasters, ointments, &c. for external applications.

OLIVE the *Spurge*. See MEZEREON.

ONION, the COMMON, or *Allium Cepa*, L. an exotic plant, probably originating from Asia.

There are several varieties of the common onion, the principal of which are known by the names of Strasburgh, Spanish, and Egyptian. They are propagated by seed, which ought to be sown towards the end of February, or early in March, during dry weather; in the proportion of six pounds per acre, on light rich land, that has previously been well dug, levelled, and cleared from all weeds. In the course of five or six weeks, the onions will appear above ground; and, after growing a month, they will, in a good soil, admit of being hoed; which operation must be performed with a small implement, not exceeding 2½ inches in breadth; and it will also be necessary to remove such as may stand too closely together, so as to leave the rest about three inches asunder. At the expiration of another month, the hoeing ought to be repeated, and the plants left four or five inches apart: in the course of six weeks, the hoe is once more employed; the weeds are carefully removed; and the onions suffered to grow only at the distance of six inches square; by which means they will attain a very large size.

Should the weather continue dry, the operations before stated, will be sufficient, till the onions are ready to be pulled; but, if the season prove damp, and weeds vegetate luxuriantly, they must be removed by the hand; because, after the onions have begun to *bulb*, it would be improper to stir them with a hoe.—Towards the middle or latter end of August, they generally cease to grow; a circumstance which may be ascertained by the shrinking of their blades: it will, therefore, now be necessary to draw them out of the earth, to cut off the tops of the blades, and to dry them, either in a warm place, or by exposing the bulbs to the sun; and turning them every second day, lest they should bud, as often happens in damp weather.—This mode of cultivation is applicable to LEEKS, on the properties of which we have already treated, in their alphabetical order.

Beside the varieties above-mentioned, there is another, denominated *Welch Onions*, which are cultivated only for spring salad; as they form no bulbs.—These are sown towards the end of July; and in the course of a fortnight appear above the ground; but in October their blades perish, and do not revive till January; when they shoot up vigorously; so that, in the month of March, the plants will be fit for the table.

The properties of onions in no respect differ from those of garlic, excepting that the former are less pungent (see vol. ii. p. 366), and are, therefore, more generally used for culinary purposes. Many persons, however, dislike them on account of the strong and disagreeable smell which they communicate to the breath: but this inconvenience may be obviated by eating a few raw leaves of parsley, immediately after partaking of onions, the scent of which is thus completely removed, and they are at the same time rendered more easy of digestion.

Onions were formerly reputed to be an efficacious remedy for suppressions of urine, and in dropsical complaints; but they are at present chiefly used in external applications, such as poultices, or cataplasms for suppurating tumors, &c.—A distilled water from these roots is frequently recommended on the Continent, as an excellent solvent of the stone and gravel.

OPHTHALMY. See INFLAMMATION of the Eye, p. 11, of this volume.

OPIUM, an inspissated gummy-resinous juice, which is obtained from the White Poppy (*Papaver album v. somniferum*, L.) a plant cultivated in Persia and Arabia, where it attains the height of 20 or 30 feet. When the heads are nearly ripe, they are wounded on one side by an instrument furnished with five edges, which make an equal number of incisions; whence the opium flows by the action of the sun's heat, and is collected on the following day, by a person who wounds the opposite side of the head; from which the juice exudes, and is received in a similar manner. As soon as it is collected, the opium is moistened with a little water or honey, and is kneaded with the hand, till it acquires

quires the consistence of pitch; after which it is formed into cakes or rolls for sale.

The best opium is imported from the province of Bahar, in the East Indies, though it appears from experiments, that this drug may be advantageously prepared in England; and the Patriotic *Society for the Encouragement of Arts*, &c. having offered liberal premiums to obtain so desirable an object, we propose to give a concise account of the methods adopted by the successful candidates, under the article Poppy.

Opium is very ponderous; of a close and compact texture; rather moist; and of a deep brown colour. It emits a faint smell, and has a very bitter acrid taste: the best sort is of a moderate firmness, possessing a very powerful odour, and a bitter, disagreeable flavour. This narcotic drug is at present greatly esteemed; and, whether used in the extract made into pills, or in the liquid form of Laudanum, it is one of the most valuable medicines. Being a very powerful antidote, as well as a remedy for procuring sleep and mitigating pain, it is but too often abused. If conjoined in certain proportions with vegetable acids, it possesses the remarkable property of preventing sleep, and exciting the mental powers. On this account, it has often, though injuriously, been employed by those who are obliged to devote their nights to sedentary or active pursuits.—See also Acids.

Among the various disorders, in which opium has been given, with good effects, we shall first mention diarrhœas, and dysenteries. It has likewise been found serviceable in relieving the tooth-ach; in allaying the pain and preventing the fever arising from wounds, fractures, or similar accidents; and also in the small-pox, both where the patient is troubled with convulsions, before the appearance of the eruption, and on the fifth or subsequent days. But as it is, on the whole, a precarious remedy, its *proper* use can be determined only by the expert practitioner.

Opium is the most certain antispasmodic hitherto discovered; and, when conjoined with laxatives, is eminently useful in colics; as, by relieving the spasm, it frequently prevents inflammations of the bowels.—Lastly, it is of the greatest service in the different species of *tetanus*, and Locked Jaw; and affords relief in the various spasmodic affections attending indigestion, hypochondriasis, the bite of a mad dog, &c.; it facilitates the passage of calculi, or stones, through the ureters; and has been found useful in some species of epilepsy.

But, though opium be thus valuable, it should not be taken in too large doses, or without medical advice; as it is not unfrequently productive of the most fatal consequences. If, however, any quantity be swallowed, or suspected to have been swallowed, either accidentally, or with a design to terminate existence, its effects will become evident by vomiting, delirium, vertigo, and an irresistible propensity to sleep. In such case, friction with salt has been found serviceable, in restoring the patient to a slight degree of animation; immediately after, it will be necessary to exhibit 12 grains of vitriolated zinc, if he be an adult. This medicine should be succeeded by water-gruel, or similar mucilaginous drink, or butter-milk, sour whey, and particularly vinegar, or strong coffee, which last appears to be the most effectual antidote.—The cold bath, and the application of blisters to the head, have likewise produced beneficial effects in recovering persons poisoned with this drug.

Opium pays, on importation, the sum of 1s. 7½d. per lb. if brought from the place of its growth; but, if not, it is subject to the duty of 4s. 11½d. per lb. When imported by the East-India Company, it pays, on warehousing, the sum of 2l. per cent. according to its value, and is liable to the farther payment of 1s. 7½d. on being taken out for home-consumption.—It has been proved, from the Custom-house lists, and other sources of information, that a larger quantity of *opium* is annually used in Great-Britain, than in all other States of Europe, collectively.

ORACHE, or *Atriplex*, L. a genus of plants, comprising seventeen species; of which the following are the principal, and indigenous:

1. The *portulacoides*, SHRUBBY-ORACHE, or SEA-PURSLANE; growing on sea-shores; flowering in the months of July and August.—It may be easily propagated from cuttings; as it requires but little culture, and thrives well if planted in a poor gravelly soil, where it seldom attains above two and a half, or three feet in height, and becomes very bushy: hence it is well adapted for gardens, among other low shrubs, where it displays a very pleasing appearance.—Being a marine vegetable, its ashes contain a large proportion of alkaline salt, and may, therefore, be usefully substituted for soap.

2. The *hastata*, WILD ORACHE, FAT-HEN, or LAMB'S QUARTERS, which grows on rubbish, dunghills, and in kitchen-gardens: it flowers in the months of August and September.—This plant is sometimes used as a substitute for spinach and other greens, though it is not relished by cows, goats, sheep, or swine.

3. The *laciniata*, or FROSTED-ORACHE, which thrives on sea-shores, and flowers in July or August.—The fruit of this annual plant contains a viscid yellow juice which, according to SCHOEPF, a respectable German writer on pharmacy, possesses similar properties with the exotic drug, termed *Gummi-Guttæ*. Hence it may be substituted for the latter, as a very powerful purgative in cases, where aqueous humours are to be evacuated; namely, in obstinate quartan agues, the humid asthma, melancholy, and especially in the dropsy: it may be given in conserves, pills, or powders, from four to eight grains for a dose.

ORANGE-TREE, or *Citrus Aurantium*, L. an exotic shrub, highly esteemed on account of its pleasant and cooling fruit.

The Orange-tree is divided into several varieties, of which the most esteemed are those of *China* and *Seville:* it is seldom raised in Britain, excepting in the hot-houses of the curious; and, its culture being the same as that of the CITRON, we refer the reader to that article.

The *flowers* of the orange-tree are highly esteemed, on account of their odoriferous perfume: they are of a slightly pungent, bitter taste, and communicate their flavour, by infusion, to rectified spirit; and also, by distillation, both to spirit and water. Formerly they were in great repute, on account of their supposed efficacy in convulsive and epileptic cases, though later experience has not confirmed these advantages:—similar virtues have been attributed to the *leaves*, which have likewise been found ineffectual in those complaints.

The juice of oranges is a pleasant sub-acid liquor, which has often proved of service in inflammatory or febrile disorders; by diminishing heat, allaying thirst, and promoting the salutary discharges. It is likewise eminently useful in the scurvy, and has, therefore, been introduced into the Navy, as part of the stores of ships destined for long voyages.

Nor is the outer rind less valuable, as it forms the basis of an excellent conserve; and, when preserved with sugar, is deservedly esteemed in desserts, being a grateful aromatic bitter, and one of the best stomachics.—There is also an oil expressed from the orange-peel, which is sold under the name of *Bergamot*.

From the flowers of this tree, an essential oil is prepared in Portugal and Italy, termed *Essentia Neroli*: this perfume is said to possess a more delicate and agreeable fragrance than even the *Ottar of Roses*; but it is with difficulty procured in Britain.

Lastly, the Seville, or *Bitter Orange*, is seldom employed in medicine at present; the China orange being generally substituted.

ORCHAL, ARGOL, or CUDBEAR; *Lichen Roccella*, L. an indigenous plant, growing upon the rocks on the coast of Guernsey; the Isle of Portland; and, we understand, also in some parts of the Highlands of Scotland.—This species attains the height of two or three inches, having cylindrical stems, which are internally white. It abounds on the islands of Teneriffe, and the Canaries, whence it is imported into Britain.

Argol is of a light colour, though it is sometimes found of a dark-grey: when mixed with lime, urine, and alkaline salts, this moss is formed into a dark-red paste, which has received the different names above-mentioned, and is much used in dyeing wool of a deep red or purple colour.—Orchal is subject to the sum of 2s. 10½d. per cwt. on importation; but, if it be brought into Britain expressly for the use of dyers, it is admitted free of duty, by the 8 GEO. I. c. 15, § 10; provided it be legally imported, regularly entered, and landed.

ORCHARD, in horticulture, a tract of land appropriated to the growth of standard fruit-trees, with a view to furnish a supply of the most useful kinds of fruit.

Orchards are sometimes confined to the cultivation of apples, pears, cherries, or other particular fruit, especially if they be situated in the vicinity of a town or city: more frequently, however, they are composed of all the trees before mentioned, with a double proportion of those bearing apples; which doubtless are the most plentiful and valuable fruit, that may be easily preserved during the whole year.

The utility of a *general* orchard, both for domestic use and the sale of its productions, is evident to the most superficial observer, independently of the beautiful appearance it presents, from an early period in the spring to the late autumn:—we shall therefore state a few hints, from *practical* writers, and *actual* experience, on the proper management of this most important department of economy.

I. EXTENT, SITUATION, and SOIL.

The *extent* of an orchard should be proportioned to that of arable land, and the quantity of fruit required either for private use, or the supply of public markets; so that the plantation may consist of from half an acre to 20 acres. As, however, there are many friends of horticulture, whose possessions confine them to a small compass; and who, nevertheless, wish to practise this useful art on a systematic plan; we have subjoined, at the conclusion of these observations, a second Cut, in which the proper place of each tree is accurately represented; and the most valuable fruit-trees are distinctly pointed out.

The *situation* and *aspect* may vary according to circumstances, provided the soil be good. All low, damp, exposures, however, ought to be purposely avoided, as no fruit-trees will flourish there; nor can their productions be fine or well flavoured. A moderately low situation, therefore, is preferable to elevated lands, provided it be *dry*; because it will thus be sheltered from the effects of tempestuous winds; though a small declivity will be very desirable, especially if its aspect incline towards the East, South-east, or to the South; which situations are always more eligible than a western exposure. But a northern aspect ought by no means to be selected, unless it be well sheltered, or the ground be peculiarly favourable to the formation of an orchard.

With respect to the *soil*, any common field, or pasture, which produces abundant crops of corn, grass, or culinary vegetables, may be chosen for laying out an orchard. If it be of a rich loamy nature, it will be of great advantage; though any soil of a good quality, may be prepared for the purpose; but, it must be neither too wet or heavy; nor too light or dry: it should be soft, easily worked, and have at least one spade deep of vegetable mould.

II. PREPARATION OF THE LAND.

This primary object of horticulture, is usually effected by *trenching*, if the plantation be intended for private use. In the preparation of very extensive orchards, it will be advisable to plough the soil to a considerable depth; but the most eligible method is, to dig trenches, one or two spades deep, according to the nature of the ground, and six or eight feet wide in each row, where the trees are in future to be placed; especially if it be grassland, and intended to be kept *in the sward*; in which case the green-sods must be laid at the bottom of each trench; because, when putrefied, they will afford an excellent manure. Should hops, or any other under-crop, be designed to be raised, it will be requisite to trench the whole of the ground; but, in either case, the spade must be carried to the depth of the natural soil.

The land, thus managed, ought likewise to be secured from the incursions of cattle, by means of a good ditch, and a well-planted hedge; which should be trained towards the north, as high and as thick as it can be carried. The plantation ought, also, to be screened on the east and west sides from the effects of boisterous winds, by means of *shaws* or shelters of Spanish chesnut, Scotch firs, ash, or other quick-growing trees.

Manure is likewise an object of the greatest importance: and, for this purpose, the sweepings of streets, those of cow and slaughter-houses, the emptying of drains and night-soil, are, in the opinion of Mr. BUCKNALL, eminently serviceable; as they "are more disposed to facilitate the growth and health of fruit-trees, than the manure from the stable."

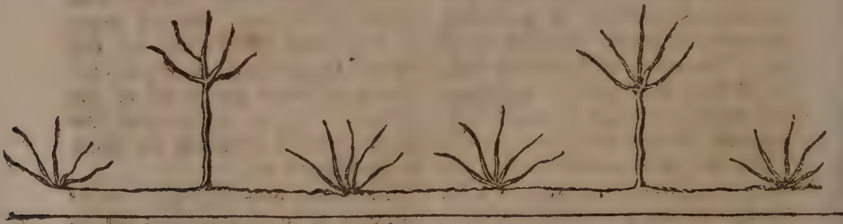
III. METHOD OF PLANTING.

The best season for planting fruit-trees is in autumn, shortly after the leaves begin to fall; from the latter end of October till the commencement of December; though, if the weather continue *open*, or mild, it may be performed at any time between the months of October and March.

As many trees become diseased with the moss, canker, &c. in consequence of an injudicious selection, Mr. B. directs them to be chosen the year before they are intended to be planted. The *orchardist*, he observes, must be particularly careful to obtain *young* and *healthy* trees; for *cankered* plants emit a vapour which is very detrimental to such as are sound; he must, likewise, see them properly pruned in the nursery, so that all extraneous or rambling branches be closely taken off, and only three or four leading shoots be left to every head: thus managed, the trees will not require to be lopped for a considerable time; and, as they will have no wounds open in the year when transplanted, their growth will be greatly promoted.

On taking up the fruit-trees, the roots should be preserved of a convenient length, in consequence of which they will incline to grow in a horizontal direction, and be more immediately influenced by the sun: their sap will become richer, and produce the sweetest and most beautiful fruit.

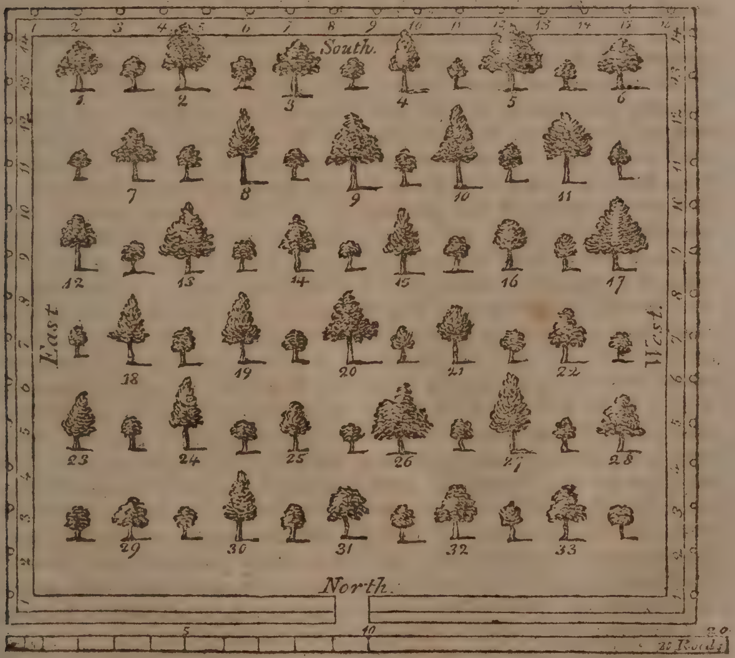
In arranging the trees, Mr. BUCKNALL directs them to be planted conformably to the mode represented in the following Cut;



One row of the tallest and strongest standards is to be set on the three cold sides; parallel to which, must be planted another row of the next *free-growers*: then, the trees are to be disposed in a similar manner, according to their strength, gradually declining in size, to the centre. Each standard is to be placed 33 feet asunder, between which two dwarf-trees should be planted; all of them being so pruned, that each row will, at the expiration of thirteen years, form an actual hedge of fruit. The intermediate spaces may be filled with hops, which should be removed, accordingly as the trees advance in growth.

Farther, the rows of trees ought to incline to a point of the compass towards the east; because the sun will shine upon them early in the forenoon, and thus dissipate the vapours, which arise during the vernal nights, and *stunt* the fruit in the earlier stages of its growth.

Having given this general outline relative to the planting of orchards, we should consider our work deficient on a subject of such importance, if we neglected the opportunity of communicating a more complete and systematic inintroduction to horticulture, with which we have been favoured by Mr. CHRIST, an eminent and practical German writer. In order to enhance the value of this essay, we have procured the subjoined Cut, which represents a design for an orchard occupying *two* acres of ground (Rhenish measure), that is, 19 roods in length, according to the horizontal rows; and 17 roods in breadth, conformably to the perpendicular lines.



In an extensive orchard, the proprietor will find it more advantageous to place the fruit-trees at a considerable distance; as, by such management, he will be enabled to train a greater variety of useful plants beneath and between those of a larger size. But, in a limited space of ground, such as that exhibited in the preceding Cut, the primary object will be to make the most economical use of the allotted ground, and to procure the greatest possible variety of fruit-bearing trees. Next, he will endeavour to arrange them so that they may stand in symmetrical order, and exhibit a pleasing sight. For this purpose, the arrangement here proposed, in an irregular square, will be found the most convenient and agreeable to the laws of vegetation. Thus, the eye, wherever it turns, not only perceives a straight line, and uniform groves, but the plan itself is likewise the most consistent; because each tree is planted, in a certain space, at the greatest possible distance from the other; and is in this manner less cumbersome to its neighbour, than it would be in a rectangular square. Hence the proper and most profitable disposition will be that of allowing three rods interval between standards, in the horizontal rows from east to west; and two and a half rods in the perpendicular lines from south to north. This space, however, would, after some time, become too narrow; one tree would impede the growth of another, and, by obstructing the air as well as the rays of the sun, prevent the ripening of fruit; if the trees were indiscriminately planted in the spots which are marked on the plan. To obviate such inconvenience, it should be understood to be a fundamental rule, that *each fruit-tree must be provided with a neighbour which is of a different growth.* It will, therefore, be requisite to make such a choice of the various kinds and species of trees, that one of a vigorous growth, with a spreading crown or top, should stand next to another that expands with less luxuriance, and has fewer or lower branches. This arrangement may be the more easily accomplished, as every zealous friend of horticulture will naturally wish to possess, in his collection, at least one, or a few trees, of every valuable kind of fruit. And, in order to facilitate such choice, we have subjoined a *catalogue* of the principal sorts of fruit-trees.

But, though the soil and space for standards, according to our plan, be rather sparingly allotted, yet there would remain a considerable piece of ground between them unemployed, for 15 or 20 years, while they are young and growing: hence it will be advisable to plant and train between every two standards in the horizontal rows, a small or dwarf tree, with a limited top or crown; bearing early and abundant fruit, till the stems have attained so large a size, and such spreading branches, as to overshadow and stifle their useful, but diminutive neighbours. Thus, the latter must, according to circumstances, yield the room they occupy, to the former; and, after having amply repaid the trouble of rearing them, and their proportion of ground-rent, they may still, with proper exertion, be transplanted to another situation.

Among all fruit-trees, there are none better calculated for intermediate plantation between standards, than the *yellow mirabelle,* and the *golden pippin.* The former is of tolerably quick growth, may be managed and pruned at pleasure, and generally bears fruit in the second year after having been transplanted: its abundant plums are of great value, both for home consumption and for sale, when in a dried state.—The golden pippin maintains the same rank among apple-trees, as the mirabelle among the plum-kind: its growth is moderate; the fruit plentiful and delicious, containing a sharp aromatic juice, and a tender pulp;—it may be preserved longer than six months.

A CATALOGUE OF THE MOST ELIGIBLE KINDS AND VARIETIES OF FRUIT-TREES.

I. *For plantations of table-fruit only.*

1. The Easter, or *Pasque Apple*, is one of the principal and finest Calvilles: it is large, with high projecting ribs, and of a bees-wax colour; has a white, tender, juicy, pulp; and emits a very grateful odour, similar to that of roses.—The tree bears abundance of fruit, but does not attain a large size.

2. The *Sarasin*, a valuable winter-pear, which ought to decorate every orchard; as it may be preserved a whole year. In shape and size, it resembles the *Bonne Louise*, but generally becomes much larger. Its red colour rises on the south side, when it turns yellow in July; acquires a mellow buttery consistence, and is then eatable. This likewise affords an excellent fruit for boiling, drying, and other domestic uses. The tree is tall and vigorous.

3. The *White Winter-Calville*, a well-known apple, much prized on account of its aromatic flavour, like that of strawberries, and its acidulated vinous juice. Being of the larger sort of apples, it is somewhat depressed, smooth, glossy, pale-yellow, surrounded with strong ridges, and sometimes red on the sun-side: it maturates on the floor from December to March.—The tree is fertile, and of a middle size.

4. The *Virgouleuse*, a delicious pear of a pyramidal form, with a deep bloom, and short, fleshy stalk. Its peel is whitish-green, and, if ripening on the floor (from December to March), generally acquires a fine yellow tint: its pulp melts in the mouth, yielding a copious aromatic juice.—The tree also grows to a moderate height.

5. The *Gravenstein Apple*, a species of the Calville (obtained from Italy), is an uncommonly fragrant, large, delicious fruit; and, though its pulp be somewhat coarse, the sap is copious and pleasing to the palate: its colour is a deep yellow, frequently marked with red on the south side. This apple is equally useful for the table and other purposes of economy; as it not only affords excellent cyder, but also, when dry, a very palatable dish: it may be kept fresh during the greater part of the winter.—The tree is of vigorous growth, and bears abundant fruit.

6. The *Streaked Rose-Apple*, (Pomme Rose panaché), a very early, and beautiful summer-fruit, of a delicious flavour and taste: it is of a middle size, rather oblong than round; of a fine red colour, mixed with yellow on the shaded side; streaked with a deeper red on the southern aspect, but every where marked with deep yellow dots. Its pulp is of a glossy white, tinted with rose-coloured streaks about the core, and beneath the

peel; mellow, and uncommonly mild: the fruit ripens in August.—The tree does not attain a large size.

7. The *Russian Ice-Apple*, or Astrakhan Apple (Pomme d'Astrachan; Transparente), is unquestionably the most eligible summer-fruit, provided the situation and climate be proper for its growth, that is, not under 49° of polar elevation. In such a region, it acquires a saccharine juice, which is so copious, that in an apple weighing $4\frac{1}{2}$ ounces, there will be found, on expression, $3\frac{1}{2}$ ounces of liquor, and one ounce of pulpy fibres. It is one of the most smiling fruits, whitish-yellow, with fine red flaming streaks on the side exposed to the sun; and may be eaten at table, or converted into cyder.—There are two varieties of this apple; namely, a larger and a smaller one; but neither of the trees become remarkably tall.

8. The *German-muscadel-pear* (Muscat Allemand), a noble, large pyramidal fruit, with a small bloom, on a shallow excavation, and rather a long stalk. When ripening on the floor, it acquires a red and yellow tint; its flesh is melting and delicate, full of a spicy, delicious juice, similar to that of muscadel grapes; eatable from March till May.—The tree forms a fine crown, and is exceedingly productive.

9. The *Nutmeg*, or *Mace-rennet*, is a valuable apple of considerable size, more globular than oblong, yellowish green, and somewhat rough, but of a dusky red on the south side. Its flesh is tender, and eats short; contains a large proportion of sweet vinous juice, having a fine aromatic taste; it becomes eatable towards the end of October; and may be preserved in its full flavour for a whole year.—The tree attains a respectable size.

10. The *Trout-pear* is a German autumnal fruit, and possesses the advantages of external beauty, a delicious taste, and unusual fertility. It somewhat resembles the *Butter-pear*, but is more oblong, has a finer yellow ground, and many deep red dots, which stand more closely together on the southern aspect. Its flesh is completely mellow, very aromatic, and may be kept longer than the *Buerré-blanc*.—The tree of the Trout-pear presents a bulky stem.

11. The *Lauermann-cherry*, is the largest and most beautiful of the heart-shaped cherries, and has an excellent taste. In shape it resembles the variegated half-ounce-cherry, and frequently surpasses it; the flesh is remarkably white, solid, and of a sweet, agreeable flavour. The stone adheres to the pulp, which ripens in June or July; when the skin on both sides acquires very bright red spots, that are imperceptibly lost in the whitish-yellow part of the centre and the shaded quarter.—The tree is of a large and bulky growth.

12. The *Old Royal Cherry*, is also of the first rank; large, dark-red, somewhat heart-shaped, with a long stalk; its flesh is red, soft, and juicy, of a spicy, and very agreeable acid taste; the stone, however, is not heart-shaped; it ripens towards the latter end of June.—The tree is handsome, though not very large; has a close, acid foliage, and is exceedingly productive.

13. The *Victorious Rennet* (Reinette triomphante), an uncommonly fine, large, and well-formed apple; which, on being deposited

on the floor, acquires a deep yellow tint, marked with starry points, and frequently brown rough spots, or large warts; its eye represents a regular star; its flesh, beneath the tender skin, is yellow; firm, though delicate; yielding abundance of juice, that possesses a pleasant aromatic flavour: it ripens about Christmas, and may be kept till March.—The tree grows luxuriantly, and becomes of a considerable size.

14. The *Ladies' Plum* (Damas Violet), a highly esteemed, large, fine, oblong fruit, of a deep violet or black colour, and a dusky bloom; its yellow pulp separates from the stone; has as weet, delicate taste; and is eatable in the middle of August.—Plum-trees, on the whole, are of a moderate growth, and generally slender.

15. The *Winter Queen* (la Reine d'hyver), a very excellent pear, of a middle size, but of different shapes and colours, being sometimes of a golden tint, with grey dots, or a few rusty spots, and sometimes marked with many rust-coloured stains.—Those of proper growth are pear-shaped, but most of them have an irregular form, with the eye on one side. The pulp is tolerably mellow, granulated about the core, and of a sweet, delicious flavour; it ripens towards the end of November, and is not easily affected by the winter.—The tree is of a moderate size.

16. The *Doctor's*, or *Cardinal's Cherry*; a large, dark-red, globular fruit, with a long and strong stalk; its pulp is red and soft; the juice agreeably sweet and acid, in equal proportions. The stone has a sharp point, and the fruit ripens about the middle of July.—The tree becomes of a tolerable size: the leaves are large, and have a sub-acid taste.

17. The *Red Borsdorfer* is a variety of the delicious German apple bearing that name, and almost excels the latter, though of a similar size and shape. On one side, this fruit is of a glossy red, and a small part of the other is yellow; dots of the latter colour being dispersed over it, and sometimes also warts. Its flesh is uncommonly white, tender, juicy, and sweet, partaking of the odour of roses. The core is encompassed by a bright-red vein. When stored, this apple ripens about Christmas, at which period the German Borsdorfer begins to decay.—The tree of the red kind is one of the largest standards; bears every year abundant fruit; and its vernal blossoms resist the severity of night-frosts.

18. The *Duke of Orleans*, usually called the *Lord's-Plum* (Prune de Monsieur), a middle-sized fruit, of a fine violet colour, with a strong bloom; almost globular; somewhat depressed on the top, with a shallow furrow. When the tree enjoys a good soil and situation, its delicate and sweet pulp melts in the mouth. It ripens so early as the end of July; and the stone readily parts with the pulp.

19. The *St. Germain*, a well-known and valuable French winter-pear, often very large; of a pyramidal form, having a thick and dotted green skin; but which, while ripening on the floor, becomes yellow. Its flesh is mellow, frequently granulated about the core, and of a peculiarly delicate taste.

20. The *Royal English Apple*: there are many varieties comprehended under this denomination; but the genuine sort, is an exceed-

ingly large, showy, and valuable fruit, belonging to the family of the Calvilles: it is very bulky below, and tapering towards the top; has strong ribs and other protuberances; and a very short, deeply inserted stalk. The skin is throughout whitish-yellow, shining, and covered with greenish-white, delicate spots. Its flavour is strong, though agreeable; the pulp is white, rather mellow; and contains a very pleasant juice, of a scent resembling that of roses: the apple is eatable in November, and may be kept till January.—The tree is of the larger kind.

21. The *Altendorf-Cherry*, is a very tender fruit, which, though belonging to the family of the acid glass-cherries with a white sap, has nevertheless a pleasant sweetish pulp: it is bright-red, of a flat globular form; has a very short, deeply inserted stalk; and ripens in the beginning of July.—The tree bears a thick, acid foliage, and does not attain any considerable size.

22. *Golden Rennet* (Reinnette d'Or) of Du Hamel; a beautiful and excellent apple, the size and shape of which are similar to that of *Borsdorf*: it is of a bright-yellow tint, marked on the south side with faint-red streaks and yellowish-brown dots: its flesh is remarkably tender, and of a glossy white; the juice has the taste and flavour peculiar to pine-apples, and which is also found in the golden pippin: when stored, it ripens in December, but attains to perfection only in February.—The tree has a healthy appearance, and is of a middling size.

23. The *Royal Plum*: (see No. 10 of the west side of the Espalier).

24. The *Gilded Butter-pear* (Beurré doré) is a luscious fruit, nearly related to the white butter-pear, having a similar taste, and ripening about the same time, but generally of a larger size, and possessing a finer coat than the latter; its peel, being glossy and smooth, resembles unpolished gold; is occasionally streaked, and marked with bright-yellow spots. There is no red colour on this pear, but its south side displays greater brightness than the opposite part which has been shaded.

25. The *Red Perdrigon*, an excellent plum of the first class, moderately large, roundish, with a strongly marked furrow; beautifully red; covered with many small gold-coloured dots, and a fine bloom. Its bright-yellow flesh is streaked with white veins; perfectly transparent; and yields a sweet delicious juice. Though its skin be somewhat tough, this plum contains no acidity; so that, in a peeled and dry state, it affords prunes not inferior to those of the white Perdrigon, and other varieties. The stone is small, and strongly adheres to the pulp; this fruit ripens about the middle of August.

26. The *New-town Pippin*, or New-York Rennet, a noble American apple, of a moderate size; well formed; of an oblong figure, and golden tint, marked with many grey dots, which become more faint towards the bloom. On the south side, it acquires a delicate red shade. Its pulp is perfectly white; firm, though tender; containing a sweet aromatic juice, of a delicious taste: this fruit becomes mellow after Christmas, and remains sound till Midsummer.—The tree forms a fine, tall standard, and has pointed leaves.

27. The *Prince's Table-Pear*, or the Long Green Summer-Pear, is

one of the most luscious early fruits, uncommonly long-shaped, quite green, having a very mellow pulp, and ripening in August.—The tree makes a tall and respectable figure.

28. The *Autumnal Anise-Rennet* (Venkel-apple, of the Dutch), a fine fruit, generally of the size of a full-grown English Pippin; bluntly pointed towards the bloomy part, or eye; having a very rough grey-yellow peel, strongly marked with whitish dots, and sometimes with warts. Its flesh is remarkably tender, having a palatable sweet juice, and a most grateful aromatic flavour resembling that of aniseed: it ripens about Michaelmas, and some pears are eatable in a fortnight after. But their spicy flavour continues only for six or eight weeks, as it is dissipated about the end of November, when they become mealy.—The tree is of low growth, like most of those producing similar fruit.

29. The *Pear-Quince*, though it cannot be classed among the fruit designed for the table, nevertheless deserves a place in every orchard; as it is used for many culinary purposes.

30. The *Easter Bergamot* (Bugi) an exceedingly delicate fruit; very large, round, somewhat thinner towards the stalk; green, marked with small grey spots; yellowish when ripe, and brown-red on its southern exposure: the pulp is uncommonly white, mellow, and without kernels: containing a copious sweet juice, slightly acidulated. This fruit ripens on the floor in January, and remains sound till March; but it ought to be left on the tree as long as possible, and not to be brought in contact with articles possessing a peculiar smell, which it readily attracts.—Its wood is bulky; though the tree, like the Bergamot kinds, in general, attains only a moderate height.

31. The *Orange Cherry*, resembles in taste that of Altendorf, described, No. 21; being a compound of sweet and acid juice, in which the former property greatly prevails. It is of a large size, somewhat compressed, with a small excavation, and a middle-sized stalk. On the south side, it is of a bright-red; on the opposite of a reddish-yellow cast; stained in all directions with transparent spots of the last-mentioned shade. During a rainy summer, it frequently becomes uniformly of an orange-colour; and ripens about the middle of July.—This valuable tree is fertile; and, though growing vigorously, never attains a considerable size.

32. The *Black Mulberry.*—If this useful tree cannot be planted near the house, or in some convenient corner of the yard, it ought not to be omitted in a complete orchard, on account of its agreeable vinous fruit, the juice of which is very palatable; as it gradually ripens, and not only affords a constant supply of berries for eight weeks, but may be converted into an excellent and wholesome wine.—The tree seldom exceeds 20 feet in height; and, though durable, demands a sheltered situation, because its sap circulates slowly, and at a late period of the spring: it requires but an indifferent, dry soil, and begins to bear fruit in the second year after being transplanted.

33. The *Folg-Cherry* is a large, dark-red, and luscious fruit, with a short stalk, and a small acid leaf: it has a sub-acid taste, accompanied

with a most grateful sweetness; is very pulpy, and marked with a deep furrow: it attains to maturity about the latter end of June, and continues till the middle of July.—The tree has a noble appearance, and affords vigorous and bulky wood.

With a view to encourage the friends of horticulture, to introduce a greater variety of fruit-trees, chiefly for the supply of the table, we have annexed a list of the principal sorts most approved, and that justly claim the first rank.

APPLES.

1. The *White Italian Rosemary-Apple* (Mela di Rosmarino), a very beautiful species of the Calville, having no ribs, but a most glossy skin, which resembles the finest virgin wax; is on all sides marked with clear white dots, and on the south, somewhat red; of an oblong figure, and the size of a goose-egg. Its flesh is white as snow, uncommonly tender, and yielding a saccharine juice of a slightly aromatic flavour. Its large pericarpium contains twenty kernels in five cells; the fruit becomes eatable about the middle of November, and remains sound till February.—The tree is of low growth.

2. The *Net-formed Rennet* (Reinette filée) is of a moderate size; yellow; intersected with grey meshy lines; and frequently covered with warts: it has a very tender, though firm pulp, an agreeably sweet juice, with the peculiar rennet-flavour; maturates towards Christmas; and may be preserved till the succeeding summer.—The tree exhibits a respectable figure.

3. The *Punctured Rennet* (Reinette piquée), a smooth, reddish-brown apple, approaching to a chesnut-colour, in shape and size resembling the largest Borsdorfer; covered with white punctures, each of which is surrounded with a green edge: its pulp is firm, mellow, and of an excellent vinous flavour; being eatable in February and March.—The tree becomes of a tolerably large size.

4. The *Great English Rennet*, a fruit which often attains the size of the *Pound-apple*; has generally flat ribs, and a strong bloom; is of a bright-yellow colour, with many small brown punctures. Its flesh is somewhat mellow, agreeable to the palate, and may be eaten from December to February.—The tree is tall, and very productive.

5. The *Norman Apple* (Reinette de Normandie); an excellent fruit, of a middling size, and regular form; when ripe, it is of a golden tint, covered with many grey, angular dots; has a very tender, yet firm, yellow pulp, containing a pungent spicy juice; ripens about the end of February, and may be preserved till Midsummer.—The tree is of an inferior size.

6. The *Noble Pippin*, an exquisite fruit for the table: of an oblong shape, tapering toward the eye; smooth, bright-yellow, with a few red streaks on the southern side. This apple ripens early, and remains sound till the end of April.—The tree, though not growing tall, bears ample fruit, even in those seasons which are unfavourable to the blossoms; it thrives in situations where other orchard-trees will not prosper.

7. The *Spotted Pippin* is one of the most elegant apples, in form and size resembling the largest Borsdorf-kind, having a stalk deeply inserted in a wide excavation:

it is, of a greenish-yellow cast, marked with numerous grey, often rust-coloured spots, and angular punctures; has a very delicate, though firm, greenish, juicy pulp, possessing a similar aromatic flavour with the English Golden Pippin; and remains sound till May.—The tree is of a moderate size.

8. The *Winter Anise-Rennet* (Fennouillet gris), is of a size and shape like that described No. 28; of a grey-fawn shade, and sometimes marked with warts; the tender pulp has the peculiar anise flavour. This apple is edible from December till February.—The tree is of low growth.

9. The *Late Yellow Rennet* (Reinette jaune tardive); a moderately large, well-formed, and beautiful apple; yellow, but on the south side reddish, with brown punctures; the pulp is mellow, juicy, and of a very agreeable vinous taste; eatable from Christmas till March.—The tree, though growing vigorously, attains only a middling height.

10. The *Nell-Gwyn*, an English fruit; uncommonly large, globular, yellow, and occasionally spotted or punctured; its yellowish pulp has a delicious sweetly-acidulated taste, and an exceedingly pleasant flavour; becomes eatable in February and March.—The tree is of the largest kind, and is very productive.

11. The *Pear Rennet*, both an autumnal and winter-fruit, presents a capital apple, of a tender yellowish pulp, the juice of which has the acidulous flavour of Rhenish wine; it is sufficiently mellow in the beginning of November, and may be preserved through the greater part of winter.—The tree is of slender growth.

12. The *Loskrieg*, or *Princes Table-apple*, a delicious autumnal fruit, vying with the former: it is of the Calville family; moderately large; somewhat oblong; whitish, and on the south side with red streaks.—The tree does not rise to a considerable height.

13. The *Reval Pear-apple* is, next to the Russian Ice-apple, the most acceptable summer-fruit, when planted in a favourable soil and situation; as it is a variety of the latter. Though of a small size, and somewhat depressed, it has a sweet, aromatic taste; is of a fine yellow tint, streaked with red, or handsomely flame-coloured. In hot summers, the pulp of this fruit, on the solar side, is converted into a saccharine juice, and acquires the consistence and taste of a delicious apricot: it ripens in August. —The tree is of the smaller sort.

PEARS.

a. The *Muscadel-Pear of Metz*, a smooth-round, and very sapid winter-pear; whitish-green, but yellow when ripening on the floor, and red on the south side; having a mellow pulp with an agreeable saccharine juice.—The tree is uncommonly fertile; though it becomes only of a moderate size.

b. The *Imperial Pear*, much resembling the *Virgouleuse*, has a tolerably mellow pulp, without stones; a sweetly flavoured juice, and is eatable in April and May. —The tree grows vigorously, and is easily distinguished by its leaves, the edges of which are curled like the foliage of the oak.

c. The *Winter-Thorn* (Epine d'hyver), in size and shape is similar to many kinds of egg-pears.—Its peel is at first whitish-green, and turns yellow, when ripening on the floor: the pulp is mellow, sweet, and of a delicious aromatic taste. This pear is fit to be eaten in November, and remains sound till the end of January.—The tree vegetates with great luxuriance.

d. The *Long Green Winter-Pear* is a fine fruit, with a long stalk: its green peel is marked with grey punctures, and the mellow saccharine pulp recommends itself by its strongly aromatic flavour. It is edible from December to February, and may be preserved still longer.—The tree makes a handsome figure.

e. The *White Butter-Pear*; and

f. The *Grey Butter-Pear*, are well known to amateurs, and deserve to stand in every orchard, being excellent autumnal fruits.—The former is also very useful for culinary purposes, even before it attains to maturity by lying on the floor: in a good soil, it often forms a very large tree; but the grey butter-pear is of a lower growth, though with more expanded branches.

g. The *De-la-Motte*, one of the most luscious autumnal pears; the tender pulp and sweet juice of which, nearly approach to that of the fruit last mentioned. It is generally large, and in a manner tumefied; of a green shade; and thickly sprinkled with large grey spots: it ripens in October and November.—The tree is only of moderate growth and height.

h. The *Savoury Pear* (la Savoureuse) is of a similar size and form with the *Virgouleuse*; more oval than pear-shaped, with a small, smoothly-situated bloom; is covered with a thin peel of a greenish-yellow cast, finely punctured: its pulp has a buttery, pleasant taste, and ripens in November.—The tree is of a middling size.

i. The *Radish-Pear*, a very superior summer fruit, the juicy part of which is so rich, refreshing, and agreeably acidulated, that it excels in its kind the grey butter-pear.—But, as it easily becomes mealy, though of a muscadel-flavour, when left to ripen on the tree, it ought to be timely removed, and deposited on the floor.—The tree is remarkably fertile, and produces fruit in seasons when almost every other pear-kind has failed: hence it deserves to be reared, even in climates and situations not very favourable to orchards; as it is of vigorous growth, and attains a tolerable size.

k. The *Non-pareil Bergamot*, is a considerably large pear, with a green peel, containing a mellow pulp, of an incomparably aromatic taste: it becomes eatable in October and November.—The tree is one of the largest among the Bergamots.

l. The *Egg-Pear*: this well-known and esteemed fruit requires no description; its delicately mellow pulp yields a highly palatable sub-acid juice of a peculiar flavour, and justly claims the preference over many of the French butter-pears.

m. The *Summer Thorn* (Epine d'eté: Fondante musqué) is a large delicious pear, of a very penetrating musky scent and taste; oblong, pear-shaped, with a fatty, tender, green skin, marked with whitish dots: its pulp liquefies in the mouth; and the fruit ripens in the beginning of September. — The tree is exceedingly fertile, and its dependent pears appear like ropes of onions; on which account the trunk arrives only at a moderate height.

n. The *Green Summer Sugar-Pear*, of Hoyerswerda; an excellent new fruit of a moderate size, and which has taken its origin from the kernel of the Winter-pear *(Sucré verd)* cultivated in Lower Lusatia: it is oblong, but arched toward the bloom; of a grass-green shade; spotted in every direction with green and grey dots: the pulp is mellow, without stones, and surpasses in taste all other summer-pears. Its juice is of a vinous, sub-acid taste, decidedly superior, at least in flavour, to its parent fruit before mentioned. If the Green Sugar-pear be suffered to ripen on the tree, it acquires a greenish-yellow shade, and its flavour approaches to that of the French *Muscat Robert*. Its period of maturation is from the middle to the end of August, and it can be preserved only a few weeks after being deposited on the floor.—The tree bears fruit every year; its blossoms resist the most unfavourable weather; and the wood remains sound in the severest winters.

o. The *Spicy Muscadel-Pear*, a handsome and delicate fruit, of the smaller kind; being of a roundish form, with a very small depressed bloom, but a long slender stalk; yellow when ripe, and of a bright orange-colour, inclining to red on the southern aspect; marked with greyish-red dots, somewhat rough to the touch. Its pulp eats *short*, and is partly granulated; contains an excellent spicy and saccharine juice, which maturates in July and the beginning of August, but cannot be preserved above eight days, as is the case with the generality of summer-pears.—The tree is of a prolific kind, and bears solitary fruit: the wood has a fine grain.

GRAPES.

For a specific account of these inestimable productions of Nature and Art, we refer the reader to the article VINE.

PLANTATIONS OF THE MOST USEFUL FRUIT-TREES IN DOMESTIC ECONOMY.

1. The *Red Stettin*, *Rostock*, or *Iron Apple*, is large, globular, dark-red, sometimes light-green on the shaded side; has a glassy, hard pulp, containing a large proportion of an excellent vinous juice: this fruit is equally regarded at the table till the latter end of August, and serviceable for boiling, baking, and converting it into perry.—The tree grows freely, and attains a great size; is not easily injured by unfavourable springs, while in blossom; and possesses other qualities which greatly recommend its culture.—The *Green Stettin Apple*, a variety of the preceding sort, also deserves to be reared.

2. The *Reine-claude* (see No. 4 on the western side of the Espalier) in the progress of this essay.

3. The *Blessed Pear* (Poire benite: Belle fertile), is thus justly denominated; as it is one of the most plentiful productions of the vegetable kingdom. LEWIS XIV. who was the first encourager of fruit-gardening in France, introduced this admirable plant into his dominions, and intrusted the nurture and propagation of it to the Carthusians, an order of Monks then flourishing at Paris. The French King had judiciously commissioned all his Ambassadors in Europe, to collect and send the most valuable

fruit-trees: with which those monastic gardeners, by their extensive nurseries, exercised (till the period of the late Revolution) a most lucrative traffic, and realized several millions of livres annually; but these noble plantations are now in a desolated state.—One of the most beneficial plants thus obtained, was the *Blessed Pear*, a yellow fruit, reddish on the south side, with a straight, rather long stalk: in hot summers, it has an agreeable juicy taste, and ripens toward the end of September. Beside their use at the dessert, these pears may be prepared in a variety of forms, for culinary dishes.—The tree, when full grown, does not exceed the middling size.

4. The *Seven-sleeper* (Siebenschläfer, of the Germans); an autumnal, moderately large, oblong apple; of a golden tint; broad toward the stalk, and somewhat tapering in the direction of the bloom. Its yellowish pulp has a very agreeable, sub-acid taste, and serves every purpose of domestic consumption.—The tree is peculiarly valuable, from this circumstance, that its blossoms appear nearly a month later than those of its neighbours: and, though it be thus exempt from the injury often occasioned by severe night-frosts in the spring, yet its fruit generally ripens about the middle of August. Hence, it merits great attention in cold situations, which are exposed to vernal blights.

5. The *Pound-Pear* is an extraordinary large, thick, oblong fruit, of a greenish-grey colour: it is often reared in the vicinity of buildings, to shelter its ponderous fruit from boisterous winds, before it has attained to maturity. Though its pulp be somewhat tough, it is a very useful pear in domestic economy, especially for drying.—The tree rises to a considerable height, and spreads its branches; is very productive; and its blossoms are not liable to be injured in the spring. There is a variety generally called the *Small Pound-Pear*, which acquires only half the size of the former, but possesses all its valuable properties.

6. The *Green Rennet*, belongs to the smaller sort of pears; has an uncommonly rough peel, of a grey colour, with a light green shade: its yellowish pulp is firm; streaked with green veins; juicy; and possesses an agreeable rennet-flavour. When laid on the floor, it ripens in January; and may, in a dry cellar, be preserved for a whole year, without becoming insipid. It is a well-tasted fruit, both for the dessert and culinary preparations.—The tree is only of a moderate size, but ably withstands the severity of the winter.

7. The *Sweet Winter-Calville*, is a large apple, externally resembling the fruit of the Calville family, with five broad and shallow ribs, but a confined pericarpium, or seed-capsule; it is more oblong than globular; beautifully red, beneath which appears a fine golden tint on the shaded side, and marked in every direction with white spots. Its flesh is faintly yellowish, tolerably firm and good; but, though it have no peculiar aromatic flavour, the fruit serves various economical purposes. In boiling, its slices remain entire, unless reduced to pulp by stirring them; and this pear is peculiarly esteemed for its soundness, which it retains till the second year after gathering.—The tree is of a large and durable kind.

8. The *Leopold-Cherry*; a dark-red and excellent fruit, of a very

agreeable acidity, and aromatic flavour: it ripens about the middle or latter end of July, and is well calculated for drying.—The tree remains of a small size.

9. The *Angoler*, one of the most valuable economical pears, on account of it uncommon abundance: it resembles the Grey Butter-Pear; is large, of a dusky-yellow, with brownish dots. Its pulp is not without flavour, and peculiarly adapted to the different processes of boiling, drying, &c. It ripens in October and November.—The tree exhibits a beautiful figure; having very large, long, broad, dark-green leaves; and its blossoms are not easily scattered.

10. The *Long Carthusian Apple*, is a capital domestic fruit, frequently of a large size, with irregular angles, and acquires a fine yellow shade on the floor. It may be preserved till the succeeding summer; and maintains the first rank for boiling or baking, in the various dishes of pastry, where it becomes sweetly mellow, and has a delicate taste. When other apples (that of Borsdorf excepted) lose their flavour by culinary preparations, the Long Carthusian is greatly improved by the action of heat.—The tree is of an ordinary size.

11. The *Sweet May-Cherry* (Royale hative), is moderately large; when perfectly ripe, rather black than dark-red; though it is but too often gathered while red, in order to accommodate the palate at an earlier season: its pulp is soft; the juice sweet, and in favourable, dry seasons, of a highly aromatic flavour; on which account it is, among the sweet cherries, eminently qualified for drying. It ripens about the middle of June.—The tree is of the largest kind.

12. The *Red-Cap-Pear* (Kappesbirne, of the Germans), is a most beneficial winter-fruit, and deserves a place in every orchard: it is of a middling size; round, but sharp-pointed towards the stalk; of a brown-red tint on the side exposed to the sun; and yellow on the opposite. Having generally a rough taste, it is not fit to be eaten in a raw state; though in hot summers it becomes partly mellow, and is well tasted. On the other hand, it is an excellent pear for boiling, drying, and particularly for sauces, or similar purposes; and may be preserved till the ensuing summer.—The tree is uncommonly large, and productive.—The *White-Cap-Pear* is round and quite green: it affords the best perry; but the tree is of a small size.

13. The *Great, Sweet May-Cherry*, has all the good properties of the variety stated, No. 11; but attains a greater height, and ripens somewhat later than that just alluded to.

14. The *White Beard-Pear* is a yellowish-green vinous fruit, rather of a small kind, but which yields a very large proportion of juice, and is therefore excellently calculated for making perry. It grows in clusters, like ropes of onions; and, if left too long on the tree, is apt to become black, and to decay; though still useful for the purpose above-mentioned.—The tree, on account of its remarkable fertility, arrives only at a moderate size.

15. The *Been-Apple*, a very valuable fruit for economical uses, and likewise for the table. It is of the larger kind; bulky at the stalk, and tapering towards the head; of a yellowish-white cast, with red flame-coloured streaks on the south side. Its pulp is white, tender,

though firm, and of an agreeable taste; the apple being edible in December, and easily preserved till the next crop. When dried in slices, it affords delicious food; and also a fine dish when boiled in a fresh state.—The tree is of a pyramidal form, rises to a considerable height; has a durable wood; does not shed its blossoms; and is very productive, so that it seldom fails of being fertile for a single season.

16. The *Count-Henneberg Cherry*, an excellent sub-acid fruit, of a moderate size; dark-red, with a long stalk; of a very agreeable taste, whether dry or preserved: it ripens in the latter part of July, or beginning of August.—The tree is of low growth, and has dependent branches.

17. The *Summer Christian*, or *Apothecaries'-Pear* (Bon Chretien d'eté), is a large tumefied fruit, of a pyramidal form, having a shivery pulp, and a copious sweet juice: it is equally delicious in a fresh state, as well as boiled, dried, and for sauces or syrups in cookery.—The tree attains a stupendous size, and is uncommonly fertile.

18. The *White Paradise*, or *Wedding-Apple*, in shape and beauty resembles that of Borsdorf, but in some seasons becomes larger. On its south side, it is beautifully tinted with red, and the other parts resemble in colour, half-bleached wax. Its flesh is of a glossy white; a tolerably good taste, yet without any peculiar flavour. When cut in slices, it is one of the finest apples, both for boiling and drying: nor is it less useful for making perry; in which respect it vies with that of Borsdorf, and imparts to the liquor a more pleasing colour than any other fruit.—The tree is of the larger kind, and its spreading branches are extremely productive.

19. The *Blue Egg-Plum*, or *Hungarian-Plum*, is of the size of a hen's egg; has a greenish pulp, containing a copious and sweet juice. It is less calculated for boiling and drying, than for the dessert; as it is in much request, and ripens in August.—The tree is one of the most fertile.

20. The *Sarasin-Pear* (see No. 2. p. 303).

21. The *Early Maat-Apple* of the Germans, is large; oblong; streaked with red, but yellow on the shaded side; having a mellow, loose pulp; and affording an excellent juice for cyder.—Although the tree be of low growth, it is remarkably prolific, and its wood very compact: the blossoms are not easily shed in unfavourable springs, so that the fruit seldom fails.

22. The *Caraway-Pear* (Besi d'Heri) is of a middling size; almost globular; brown-red on the south side, and greenish-yellow in other parts: while fresh, it supplies the table, and may also be converted to other economical purposes; being a very tender aromatic pear, which ripens in September.—The tree does not exceed a middling size, though it bears abundance of fruit.

23. The *Domestic Plum* is so generally known and cultivated, that it may be considered as one of the most useful fruits; though a single tree will yield but a scanty supply. This species may be easily propagated from the kernel; and those trees which have been improved by engrafting, inoculating,

or inarching, produce a larger and more delicate fruit, which readily separates from the stone.

24. The *Streaked*, or *Striped Apple*, of the Germans, is a very profitable fruit in domestic economy; of a globular, though compressed form; a moderate size; yellow cast; and marked with red streaks. Its sweet pulp yields a copious juice: it furnishes a palatable dish, whether boiled or dried in slices; and may be advantageously converted into cyder. This apple ripens early, and remains sound till February.—The tree attains a very respectable size and age; is one of the most productive; and its blossoms resist the vernal frosts.

25. The *Spanish Cherry*, a noble fruit for drying, preserving, &c. is of a large size; dark-red tint, approaching to black; flatly compressed below; and having a short stalk. Its juice is of a deep-red dye; of a mild sub-acid, and pleasant taste: it ripens about the middle of July.

26. The *Late Maat-Apple* of the Germans, is a most beneficial fruit both in autumn and winter. Although its blossoms appear several weeks later than those of the former, in consequence of which it is seldom affected by the spring-frosts, yet it ripens, and is eatable at an earlier period, and may be preserved throughout the winter. It is of a considerable size; of a yellow shade with red streaks; its pulp has a fine taste; and it is, on the whole, a very useful apple in domestic life.—The tree forms a large, spreading crown, and bears in abundance.

27. The *Egg-Pear* (Bestebirne) a national fruit of the Germans, is not only (see *l*, p. 302) much esteemed at the dessert, but also yields fine perry, or vinegar.—The tree is of the productive class, and deserves a place in every orchard.

28. The *Pound-Apple* (Tellerapfel), is likewise a German production, which deserves to be reared both for its uncommonly large size, and the steadiness of its blossoms in unfavourable springs. It ripens on the floor, and becomes unctuous to the touch. Its pulp is partly mellow, and of a fine sub-acid taste. It remains sound from November to February, and frequently till May; being chiefly calculated for boiling, drying, and the making of cyder.—The tree exhibits a fine and expanded crown.

29. The *Pear-Quince* (see above No. 29) is a very serviceable fruit to the housewife; and though, when boiled, it require a large portion of sugar, yet this expensive article may be supplied by the syrup obtained from pears. Dried in slices, the pear-quince imparts to boiled fruit an agreeable flavour.

30. The *German Fleiner Apple*, is a large, beautiful, glossy, yellow fruit, rather oblong than globular, and ranks in the first class of economical fruit: on the south side, it is tinted with red, and may be regarded as a counter-part of the Been-apple, described No. 15, p. 305. It remains sound till April; and its pulp partakes of a sweet and acid taste; having a strongly aromatic and agreeable flavour.—The tree attains a respectable size.

31. An *improved variety of the Plum*.—See No. 23, p. 306.

32. A *Black Mulberry Tree*.—See above No. 32.

33. The *Brussels Brown Morel*, a dark-red, spherical, acid cherry, containing a richly tinctured juice, of a very pleasant taste. When perfectly ripe, about the latter end

of July, it is equally fit to be dried and preserved for use.—The tree remains of a small size, like the Morels in general, and has dependent branches; but it is exceedingly fruitful, immediately after the first year of engrafting.

ON THE MOST ADVANTAGEOUS METHOD OF ARRANGING THE ESPALIERS.

An orchard that is encompassed by a wall, or railed with suitable boards, not only affords protection to the fruit, but its value may be considerably enhanced by the rearing of dwarf-trees. The most profitable and delicious of this description are doubtless the *Peaches*, especially if they be intended for sale in a public market: hence we shall concisely state the principal sorts of such fruit as may be planted with the greatest advantage on the *eastern* and *southern* sides.—Early peaches are always more favourably situated in an eastern than in a southern aspect; for, when placed in the former, they are not so liable to be injured by night-frosts as in the latter: on the contrary, late peaches require more solar heat, and will consequently be better adapted to a southern exposure.—*Apricots*, likewise, may be more easily and beneficially raised on the east than on the south side of the garden; because the heat of the sun exsiccates, and renders them mealy; independently of which circumstance, they are in the meridian direction more liable to be injured by night-frosts.—The *western* wall will be most usefully formed into espaliers of *Cherry* and *Plum-trees*, as likewise for planting *early Grapes*.—Lastly, even the *northern* side is advantageously employed by the skilful gardener, who will, in this situation, endeavour to introduce the best species of hazle-nuts, filberts, &c.

Plantation along the Eastern side of the Wall, or Railment; consisting of early Peaches and Apricots.

If the wall, or other inclosurse round the orchard, be from 7 to 8 feet high, the espalier ought to occupy a space of from 12 to 14 feet. In case, however, the wall should be only 6 or 6½ feet high, it will be necessary to form the plantation of peaches, at the distance of 18 or 20 feet from the neighbouring trees.

I. *The following list contains a view of the most valuable and early sorts of Peaches and Apricots, which should adorn the Eastern side of the Wall.*

1. The *Small Naked Early Peach* (Petite Violette-hative) yields a tolerably mellow fruit, of a yellowish shade, but rose-coloured about the kernel; its juice is strongly aromatic, and of a delicious taste. It ripens in the beginning of September, somewhat earlier than the large variety of the same name.

2, and 3. The *Pine-Apple Apricot*, is one of the most savoury; more oblong than round, marked with deep-red spots on the south side, and, in other parts, of a golden tint. Its pulp is throughout of a reddish-yellow colour, and contains a highly flavoured, palatable juice. It never turns mealy, like the other sorts, and ripens about the middle of August. Its kernel is as sweet as an almond.

4. The *Brussels Apricot* (Abricot de Nancy), is of a considerable size; somewhat oval, being slightly red; and for the most part of a pale yellow shade; its pulp is reddish-yellow, and melts in the mouth;

the copious juice is of an agreeable taste and flavour.—This fruit also attains to perfection in August.

5. The *Large Early Apricot* (Grand Abricot hatif; Abricot commun), a large and beautiful fruit, of a dark-yellow shade, and sometimes red; it has a good juicy pulp, but no peculiar flavour; and easily turns mealy, after having arrived at the point of maturity. It becomes ripe soon after the small early apricot.

6. The *Large Sugar Apricot* resembles in size and shape the preceding variety; but, when full grown, has a coat somewhat fallow; its pulp is of a golden hue, and remarkably saccharine; it ripens after the early sort last mentioned.

7. The *Early Montague Peach* is of a large and handsome size; of a fine red tint on the side exposed to the sun, and a yellowish cast in other parts; being juicy, sweet, and without any red dye about the kernel, from which it is not readily separated: it ripens about the latter end of August.

8. The *Bellegarde* is likewise a very beautiful, large, and excellent peach, with a strong tint of red on a yellow ground, and of a deep-red shade on the south side. Its pulp, though rather firm, yields a sweet juice of an agreeable taste; the fruit is in season together with the preceding kind.

9, and 10. The *Maltese Peach* is highly esteemed by those who prefer a sweet to a vinous taste: it is of a middling size, a spherical form, red-streaked on the south side, and, in other directions yellow; the pulp is white, exceedingly delicate; melts without appearing watery; contains an uncommon proportion of saccharine matter; and has an exquisite flavour. The stone firmly adheres to the flesh, and presents a small point in one of its extremities; the fruit arrives at maturity toward the end of September.

11. The *Red Magdalen* is also a fine, inviting peach; having a white mellow pulp, which is red around the kernel; affords a savoury, sweet juice; and ripens about the middle of September.

12. The *Charlestown*, or *Ananas Peach*, is a new sort, reared in America, from the kernel. Although its colour is inferior to that of most other peaches, being of an uniformly pale yellow, without any red tint, yet its firm and juicy pulp possesses the delicious flavour of the pine-apple: it ripens in the beginning of October.

13. The *Genoese Peach* maintains the first rank; being of a considerable size, and marbled of a bright-red tint on the south side; its dark-yellow pulp is incomparably delicate, resembles in flavour that of the melon; and is of a rose-red hue around the stone: this fruit attains to perfection about Michaelmas, or somewhat later.

14. The *White Magdalen*, a tolerably large, round peach, of a yellowish-white, but of a lively red on the south side: its pulp is mellow, and very grateful to the palate; of a rose-red tint about the stone, and yielding a sweet juice: it is eatable about the middle of September.

II. *Plantation along the South-side of the Orchard, with Peaches of the first rank, but which attain to maturity at a later period.*

1, and 2. The *Maltese Peach.*—See above, No. 9.

3. The *Red Magdalen.*—See No. 11.

4. The *Admirable Peach*, a very large and comely fruit, of an agreeable mixture of colours; its pulp, though rather firm, has a delicate taste; contains a sweet, vinous juice, of a fine flavour; and is pale-red near the stone: it becomes eatable about the middle of September.

5. The *White Magdalen.*—See above, No. 14.

6. The *Genoese Peach.*—See No. 13.

7. The *Charlestown Ananas Peach.*—See No. 12.

8. The *Small Charlestown Ananas Peach*, agrees in colour and other respects with that of a larger size; and, though of inferior growth, it excels in taste, and partakes more of the Pine-apple flavour.

9. The same Peach of the smaller kind.

10. The same, of the larger sort.

11. The *Genoese Peach.*

12. The *Great, Red, Naked Early Peach*, the top of which is of a very dark-red hue, and the lower part greenish-yellow; its mellow pulp partakes of a yellow tint, but is rose-red around the stone; of an agreeably sweet vinous taste, and excellent flavour; arriving at perfection in the beginning of September.

13. The *Noble Peach* is large, spherical, marbled; of a purple tint; has a luscious taste; is faintly red about the stone; and ripens in September.

14. The *Giant Nectarine* (Pavie monstreuse, ou de Pomponne) is the largest of all the peaches, and a true ornament to the dessert; as it displays a beautiful red tint on a white ground. Its pulp is white, though red in the parts next the stone, and contains a vinous, sweet juice; but requires a favourable summer, a mild autumn, and the warmest situation in the espalier: it is mature in October.

15. The *Chancellor's Peach*, a very large, somewhat oblong fruit, marked with a deep furrow, and a small wart; having a fine skin, beautifully red on the south side: its pulp is delicate, and yields a saccharine juice. It may be eaten in the beginning of September.

16. The *Princess's Peach*, or *Large French Mignonne*, one of the most handsome and delicious fruits, of a dark-red and greenish-yellow cast; having a white, melting, and agreeable pulp; containing a sweetish, vinous juice; and being in season about the middle of September.

III. *Plantation along the Western side of the Orchard, for raising Cherries, Plums, and early Grapes.*

1. The *Large Glass-Cherry*, is the most bulky of those early productions, and one of the finest bright-red morels; having a white juice and a short stalk: its pungent taste is accompanied with an agreeable sweetness; and the fruit ripens in the beginning of July.

2. The *Black Perdrigon*, a large oblong plum, of a dark-blue colour mingled with faint yellow, and covered with a strong bloom: its light-yellow pulp is firm, yet delicious to the palate; abounds with a sweet, aromatic juice; and the fruit may be gathered towards the end of August.

3. The *Large Montmorency* is one of the best glass-cherries, flatly compressed below; with a thick, short, and deeply-inserted stalk: the pulp is yellowish, of a delicate taste; yields an agreeably-acidulated juice, and is in perfection about the latter part of July.

4. The *Large Green Reine-Claude* (Dauphine), a well-known cherry, that ranks among the finest fruits of the kind; it is in great estimation on account of its copious, mellow, and saccharine juice, which is of a peculiarly delicious taste: this cherry attains to maturity in the beginning of August.

5. The *Black Burgundy Grape* is rather below the middling size, but of a sweet, delicious taste, and begins to ripen about the middle of August.

6. The *White Early Leipzig Grape*, is likewise of a moderate size, and produces very sweet, oblong berries; becomes eatable about the latter end of August, but is much improved by remaining on the vine till towards autumn.

7. The *Black Burgundy Grape*. —See above, No. 5.

8. The *St. John's Plum*, a very early, blue, round, and valuable fruit.

9. The *Leopold Cherry* is a dark-red morel, with a long stalk, and is highly esteemed: it has an acidulated, savoury juice, of an exceedingly pleasant taste, and ripens in the latter part of July.

10. The *Royal Plum* is of a very large size, and one of the most delicious fruits; having a spherical form, with a thin, long, and deeply-inserted stalk: its skin is of a violet hue, marked with many gold-coloured spots: the yellowish-green pulp abounds with a sweetish juice, slightly acidulated, so as to impart to it an agreeably-pungent taste: its period of maturity is towards the end of August.

11. The *Early Natt*, of the Germans, is an exceedingly luscious and large cherry, produced from the kernel; its bright glossy skin is of a fine red colour; and the tender pulp yields a sub-acid juice highly grateful to the palate. The tree is uncommonly productive; and the fruit, being one of the earliest in season, ripens in the beginning of June.

12. The *Green* or *White Indian Plum*, is a most grateful production, exceeding in flavour the *Reine-Claude* (No. 4): and though it be little known at present, this whitish-green fruit merits a place in every orchard.

13. The *Red Early Wanfried-Cherry* is of German origin, and of a large size: its pulp is delicate, though not very tender; and contains a whitish sub-acid juice: this savoury fruit is eatable in the beginning of June; and the tree is of the most fertile kind.

14. The *Black Spanish Early Heart-Cherry*, vies with the most exquisite kinds of that class, and is eminently calculated for espaliers. On account of its early and great fertility, the tree is of an inferior size, but loaded with fruit, the mellow pulp of which has a sub-acid taste, and an excellent flavour.

IV. *Plantation along the North-side of the Orchard: or Espaliers consisting of fruit-bearing Shrubs.*

Although this situation is, on the whole, less favourable to the growth and maturity of fruit, yet every industrious gardener will here also endeavour to cultivate quinces, medlar trees, hazel-nuts, &c. because their productions are subservient to many useful purposes in domestic economy. Such plants, indeed, will not vegetate very luxuriantly, or afford early and luscious ornaments of the desert; but they may with advantage be employed for culinary dishes, or for supplying the table in a fresh state, at an advanced season.

Among the QUINCES, the German Pear-quince, and that of Portugal, are the two principal varieties: they are of similar shape, and differ only in this circumstance, that the former, when boiled, remains entire; while the latter, being more tender, is dissolved into a pulp.

There are thirteen species of the MEDLAR-TREE; of which only one is indigenous (see p. 187): but among all the foreign sorts, Mr. CHRIST recommends the *Dutch Garden Medlar*, as the only and most eligible one for espaliers.

HAZEL-NUTS.

In the enumeration of the following excellent varieties, we have adopted the botanical characters given by BECHSTEIN, both on account of their precision, and the appropriate nomenclature, which Mr. CHRIST has omitted in his Essay.

1. The *Zellar*, or *Pound-Nut* (Avellana fructu rotundo maximo), which bears large round nuts flatly compressed on the top; the shell is brown, streaked with white, and spontaneously opens on the point.

2. The *Common Lambert*, or *Almond-Nut* (Corylus sativa), with a long, thin, pointed, sweet kernel; the shell of which is completely inclosed in the flower-cup.

3. The *Large Lambert*, or *Blood-Nut* (Corylus sativa fructu oblongo rubente maximo): the green cover inclosing the young nut is nearly cylindrical, and somewhat edged at the top. While in an unripe state, it is of a reddish cast, and rather downy on the upper part: in some, the kernel has a dark-red; in others, a white skin: they are of a peculiar, sweet, and agreeable taste; and ripen about the middle of August.

4. The *Spanish Hazel-Nut* (Corylus Hispanica), which attains the uncommon size of two inches in length, and one in thickness: its thin shell is angular towards the head; always remains white; and is half covered by the flower-cup. It ripens at a later season; and the kernel is less sweet than that of the preceding sort.

5. The *Hazel Nut-Tree* (Corylus arborescens) attains a high, thick stem; and forms a crown at the top: the nuts are disposed in large clusters; they have a nearly globular form, being smoothly compressed above, and somewhat pointed below.

On the most advantageous method of employing the space between the Espaliers, and the Wall or Railment.

The borders of espaliers require a breadth of 2½ or 3 feet from the dwarf-trees or shrubs: such soil will, however, not admit of vegetables striking deep roots, or of bushy plants, which rise to a considerable height; as the former would withdraw the nourishment from the roots of fruit-trees; while the latter might obstruct their growth, by intercepting the air, and solar rays. Nevertheless, a variety of useful herbs may be reared on these borders, with a view to supply the dessert, throughout the summer and autumn, with delicious fruit. For this purpose, the *Strawberries* claim the first rank; because they may be cultivated on the four different sides:—those exposed to the south will be the earliest; then will follow those growing along the eastern wall; somewhat

what later such as occupy the western border; and, lastly, those which have a northern aspect; the plants being 12 inches distant from each other.—Next, in rank, is the *Raspberry* (Rubus Idœus, L.); which ought properly to stand along the northern border; but, being a luxuriant and spreading shrub, it will with advantage be placed in a distant corner. The principal, and most productive varieties of the latter, are those two, termed the *English Double-bearing Red*, and *White Raspberry*.—Beside the shrubs already mentioned, a complete orchard should likewise contain the best sorts of *Currants* and *Gooseberries*, of which we shall here enumerate the most esteemed varieties; having already given an introductory description of both, in their alphabetical order.

CURRANTS.

As these berries, which remain for several weeks on the bushes without decaying, progressively become sweeter and more vinous, we would recommend the culture of the following varieties, as the most valuable:

1. The Large, Red Dutch Currant.
2. The Large, White Dutch Currant.
3. The Large, Flesh-coloured Champagne Currant.

GOOSEBERRIES.

There are numerous sorts of this excellent fruit, which have been raised from the seeds, principally by English gardeners, who at present enumerate not less than 280 varieties: from these, we have selected the following 24, which are equally esteemed for their uncommonly large size and exquisite flavour.

Red Gooseberries.

1. *Cheetham's Bright Venus*, is a large berry; smooth, or without hair; beautifully red; and of a delicate taste.
2. *Coe's Hannibal*, a very large, oval, smooth berry.
3. *Down's Cheshire Round*, a pale-red, transparent berry, marked with red spots.
4. *Mason's Hercules*, a very inviting fruit; large; globular; without hair; uncommonly handsome; and very transparent.
5. *Taylor's Red Rose*; also very large; oval; rose-coloured; and hairy.
6. *Victory*; one of the largest gooseberries; oval; hairy; and rose-coloured.
7. *Withington's Princess-Royal*; is of a good size; round; hairy; and dark-red.

White Gooseberries.

8. *Chapman's Highland White*; is large; globular; red-spotted on its south side; and covered with a few fine hairs.
9. *Liptrot's Duke of Bedford*; a large, oblong, and smooth berry.
10. *Mill's Champion*; is also large and oblong, but somewhat tapering towards the stalk; having a white and perfectly transparent skin.
11. *Stafford's White Imperial*; a capital, early sort; uncommonly bulky; so that the largest, which are slightly oval, attain the size of a walnut; but the smaller ones are of a round form; having a smooth, tender skin, and ripening about the middle of July.

Green Gooseberries.

12. *Boardman's Green Oak*, is large, globular, and smooth.
13. *Creeping Germes*, a very early,

early, large, globular berry, though some are oblong; green, with white veins; of a sweet and agreeable taste.

14. *Fox's Green Goose,* is likewise unusually large; globular; covered with hair; and of an exceedingly fine flavour.

15. *Mill's Langley Green,* vies in size with the two preceding sorts, but is of an oval form: its taste is delicious; and the leaf is distinguished from other varieties by its indented shape.

16. *Johnson's Green Willow,* a moderately large, oblong berry; pointed near the stalk, and round towards the bloom: it is oval, smooth, and streaked with white veins.

17. *Shelmardine's Gently-Green*; a large, oblong, and smooth berry.

Yellow and Amber-coloured.

18. *Bell's Bright Farmer*; a very large, oval, and elegant, early fruit; marked with bright-yellow veins: it is smooth, though a few hairs occasionally appear on the skin.

19. *Blackley's Eclipse*; a large, smooth berry; oval; yellow, with green veins; and of a savoury juice.

20. *Bradshaw's Yellow-top,* is globular; smooth, with a few hairs, and of early growth.

21. *Clayton's Canary*; a large, round, greenish-yellow berry; covered with hairs; and being of a good taste.

22. *Mason's Golden Conqueror*; a large, handsome, bright-yellow berry.

23. *Stanley's Dolphin,* a very early sort; being one of the largest and most esteemed: it is oval, greenish-yellow, and smooth.

24. *Taylor's Nimrod,* is also an early fruit, of an uncommonly large size; globular; without hair; of a dark-yellow shade, marked with bright-yellow veins: it has a transparent skin, and ripens about the middle of July.

Beside the varieties here specified, we find in a late catalogue, published by an eminent gardener, the following sorts enumerated under the head of *New Gooseberries:*

White: Beeman's White Elephant; and White Lily.

Yellow: Nonsuch; Wigley's Melon; Golden Lion; and Invincible.

Green: Anthony Triumph; Miss Bold; Nield's Green Gage; Mrs. Ewe; Royal George; and Montgomery.

Red: Black Prince; Black Conquerer; Robin Hood; Stafford's Hedge-hog; General Howe; and Supreme.

For an account of the most eligible and productive species of the RASPBERRY, as well as the STRAWBERRY, we refer the reader to these articles, in the progress of the alphabet.

It will, however, not be superfluous, to remind the friends of gardening in this country, that the preceding arrangement and description of the different standard and dwarf fruit-trees, as well as of the espaliers, shrubbery, and fruit-bearing plants, is the result of experience communicated to the public by a *German Orchardist.* Hence we think it useful to remark, that though *his* statement, with regard to the nature and rearing of the various fruit-bearing vegetables before detailed, may be perfectly correct; yet the temperature of the British climate, when compared with that of the middle of *Germany,* naturally retards the maturity of all fruits reared in the open air, at least a fortnight, in the counties situated to the west, whether in a southern or northern direction; and from three to four weeks, in the direct northern parts of the kingdom:—on the other hand, the climate in the southern and south-eastern counties of England, may be considered as nearly equal in point of heat, to that of the German provinces bordering on the rivers Rhine and Danube.—This circumstance deserves particular attention; as otherwise, the practical gardener will often be disappointed in the expectation of *early* fruit.

Scions for engrafting or inoculating from most, or all, of the foreign varieties before specified, may be procured either by way of Hamburgh, from the orchardists of that city, or by applying to the gardener who superintends the Electoral Orchard at Herrnhawsen, near Hanover.

With respect to the method of planting the trees:—A wide hole must be dug for each, being sufficiently capacious to receive all the roots freely, so that they may not touch the sides. A single fruit-tree should now be deposited in each hole, one person holding its stem erect, while another breaks the earth in small pieces, and throws it in equally upon the roots; the tree being occasionally shaken, that the mould may lie closely on all the smaller roots and fibres, and the plant be gradually elevated, till the top or crown of the roots is only two or three inches below the common surface of the earth. When the cavity is properly filled, it must be gently pressed with the foot; first on the outside, and then advancing gradually towards the stem, the surface being formed somewhat hollow. Lastly, a few inverted sods, or pieces of turf, must be laid over the whole, so as to form a kind of circular bank, three or four inches high; which will not only support the tree, but at the same time shelter the roots from drying winds, and those droughts that sometimes prevail in hot summers. During these operations, the planters must be particularly attentive, that each tree stand perfectly erect, and be arranged in rows, in the manner above described.

Lastly, the soil beneath and between the fruit-trees, till they arrive at their complete size, should by no means be neglected; as the excellence and maturity of the fruits will in a great measure depend upon its proper culture.—Hence, no grass or weeds should be suffered to grow under the standards; but the ground ought to be frequently stirred with the spade and hoe, in order that the fertilizing particles of rain, air, dew, snow, &c. may more easily penetrate into the earth, and produce beneficial effects on the roots of fruit-bearing trees and shrubs. Such an expedient not only tends to promote their fertility; but it is likewise one of the most effectual means of preserving them in a sound and healthy state. Independently of these advantages, the soil itself will thus be so much improved, that it may serve for raising the most abundant crops of vegetable roots, and especially *turnips* and *potatoes*. The former are peculiarly calculated for this purpose; as they do not exhaust the soil in any degree equal to the impoverishing effects of the latter. On the whole, we shall conclude with observing, that the art of gardening has lately been carried to a very high degree of perfection in this country, which may justly boast of the most intelligent and skilful orchardists. And, though we have not so great a number of scientific gardeners, or such extensive and systematic orchards to exhibit, as the Germans, French, and Dutch; yet the continual migration of industrious gardeners from the northern quarter of the island, toward the British metropolis, will ultimately be attended with the best effects. Thus, we may hope to see, in time, a greater number of regular *private orchards* established in England: and with a view to accelerate the fulfilment of this patriotic wish, we think it our duty to mention the title of the following practical and useful work, though we have not had an opportunity of examining its contents: "*A Plan of an Orchard:* exhibiting, at one view, a select quantity of Trees sufficient for planting an Acre and a Half of Land, properly arranged according to their usual size of growth and hardiness of bearing: in which is comprised, a Collection of the most esteemed *Orchard Fruit*, proper for the Table and the Kitchen, in regular succession throughout the season: shewing also, in a distinct *Table*, others nearly similar in quality, size, use, and time of maturity; with an *Alphabetical List* of above *Eight Hundred* Species and Varieties, such as are now cultivated in England; together with the different names by which they are generally known. By George Lindley." (Fol. 2s. Lond. Champante and Whitrow, 1796.)—The Monthly Reviewers observe, that "this is a pretty present to the young orchardist; and the alphabetical list of fruit-trees may be found useful to the more experienced. Difficulty will always be a spur to ingenuity:—gardening, therefore, is studied in Scotland, and orcharding in Norfolk."

ORCHIS, or *Orchis*, L. a genus of plants, comprising sixty-five species, nine of which are indigenous; and the most remarkable of these are:

1. The *mascula*, Early Orchis, or Male Fool-stones, growing in meadows and pastures; flowering in the month of May.—According to an account inserted in the 59th vol. of the "*Philosophical Transactions*," Mr. Moult maintains, that from the roots of this species is prepared the celebrated *Salep-powder*, which has been highly recommended in cases of consumption (see vol. ii. p. 50), bilious dysenteries, strangury, and disorders of the chest.—The roots should be gathered when the seed is formed, and the stalk is about to decay; for the new bulb (of which *salep* is prepared) has then attained its full size. After separating the new roots from the stalk, washing them in water, and removing the exterior thin skin, they are placed on a tin plate in an oven, previously heated to the degree requisite for baking bread. Thus, in about ten minutes, they will acquire the transparency of horn, without being diminished in size: next, they should be spread out in another room, where they will dry and harden in a few days: or the same object may be effected in a very moderate heat, within a few hours.

2. The *morio*, Meadow Orchis, or Female Fool-stones, grows on moist meadows and pastures; flowers in May and June.—The roots are roundish; the stalk

is about a foot-high; and the leaves have the shape of lancets. This species deserves to be mentioned here, on the authority of Bechstein, who observes, that it is considered as possessing, and even surpassing, the virtues of the foreign salep-root; and, though some naturalists have been of opinion, that the *Early Orchis* is the genuine root imported from Persia, yet we would recommend the culture of the meadow orchis.

Either of these species may be propagated by their roots; which, as the seeds do not vegetate, must be planted in summer, about three inches deep, in a dry soil; where they should remain undisturbed for several years, because they will flourish in proportion to the length of time they have been suffered to grow in the same place.—If, at any future period, this excellent vegetable should be introduced into general use, by the patriotic efforts of enlightened agriculturists, its roots will furnish a cheap, wholesome, and most nutritious substitute for many foreign drugs, such as Sago, Tapioca, Arrow-root, &c. —See also Salep.

ORPIMENT, a bituminous mineral, consisting of arsenic and sulphur, often found native in the earth, though it may also be artificially prepared.

This ore has also lately been discovered in the county of Cornwall, whence a specimen was sent to Dr. Hill, under the name of *red mundic*. It is both red and yellow; and, when refined by distillation, forms the colour known by the name of *King's Yellow*.

Orpiment has, by some, been supposed to be harmless, on account of the large proportion of sulphur which it contains; but, according to Macquer, it is productive of the most fatal consequences, and ought not to be used without the greatest caution. Instances having occurred of its noxious properties, it may be ascertained by the following symptoms, whether any person has actually swallowed this drug: Shuddering, anxiety, tremor, violent nausea, and vomiting; an ardent sensation in the throat; fever; thirst; suppression of urine; costiveness; gnawing pain in the intestines; the face swells; while torpor and stupefaction close the cene.

Remedies: As soon as it is obvious that orpiment has been swallowed, the patient (if he be an adult) should drink a tea-cupful of a lukewarm solution of soap in pure water; or, with equal effect, strong solutions of honey; and repeat these draughts according to circumstances. If the former has been used, it will be advisable to take a piece of sugar in the mouth, to overpower its very disgusting taste. Considerable benefit has, likewise, been derived from immediate emetics, or vomiting, excited by stimulating the throat with a feather. At the same time, it will be necessary to apply to the abdomen, cloths dipped in a solution of soap in soft water, with a view to alleviate the pains in the intestines.—Clysters of milk and oil, and tepid bathing in diluted soap-water, have also been found very serviceable, in restoring the patient to some degree of animation.

ORPINE, the Common, or Orpine-Stonecrop, *Sedum Telephium*, L. an indigenous perennial plant, growing on pastures and in hedges; flowering in the month of August.

This luxuriant herb may be easily

propagated, either by parting the roots; or by slips, or cuttings of the stalks, in summer; it thrives well in dry soils, being of succulent growth; and spreads rapidly into tufted branches; when cultivated in gardens, on account of its variegated appearance.—A decoction of the leaves in milk, operates as a diuretic, and has occasionally been administered, with success, as a cure for the piles.—Cows, goats, sheep, and swine, eat this plant, but it is wholly refused by horses.

ORTOLAN, or *Emberiza hortulana*, L. a delicate exotic bird, inhabiting France, Italy, and the southern parts of Europe; though it also visits Germany, Sweden, and Britain, in which countries these birds are caught during their migration. They feed principally on panick-grass, and grow very fat, especially when fed with oats and millet; and confined in dark cages.

The greatest traffic with ortolans is carried on by the inhabitants of the Island of Cyprus, where they are caught in great numbers, and pickled in casks; each containing from 3 to 400 birds, prepared in spice and vinegar; after having cut off their heads and lower extremities. In this state, they are imported into England, France, and Holland, for the table of the epicure, who pays a high price for these delicious morsels, on account of their exquisite flavour.—Funke informs us that, in productive years, 400 such casks, or, upon an average, 140,000 of these charming warblers, are sacrificed to the palate of man, in the small island above mentioned.

According to Prof. Bradley, ortolans, as well as quails, visit this country in April (arriving at the same time with the swallows), and leave it in September. They are in season during the months of July, August, and September: being generally lean after their long passage in the spring, few are then fit to be eaten. Their most favourite places of resort, are plantations of vines in the vicinity of oat-fields, where they may be taken in bow-nets.

Considered as an article of food, ortolans roasted in a *fresh* state, afford a grateful, and not unwholesome dish; but, when pickled and imbued with the most stimulating spices, they ought to be eaten with moderation, or rather avoided by invalids, and those whose circulating humours are already in a depraved state.

OSIER, or *Salix viminalis*, L. an indigenous plant, growing in woods, and hedges, especially on boggy land: it flowers in the months of April and May.

This shrub is very valuable; as its leaves are eaten by horses, cows, sheep, and goats; its pliant twigs are woven into *putcheons*; *wheels* for taking eels; and into bird-cages: the branches are much used for making hoops, and large baskets. Farther, it forms a hardy and useful hedge for excluding boisterous winds; and, as it flourishes in wet situations, is frequently planted, with a view to prevent the banks of rivers from being washed away by the force of the current.

On account of these valuable properties, osiers have deservedly become an object of public attention; and, in consequence of the liberal premiums offered by the Society for the Encouragement of Arts, &c. we are enabled to specify such of the numerous varieties as deserve to be preferably cultivated.

Osiers are divided into two

classes: the first is known by their more blunt, and downy or mealy leaves; which, in the other, are more pointed, smooth, and green, resembling those of the myrtle.

The *first* class contains, according to the statement of Mr. PHILLIPS (*Transactions of the Society*, &c. vol. 16), nine or ten varieties, the best of which is denominated the *Grey* or *Brindled Osier*.—It varies from the others only in its bark being streaked with a red or blood-colour. The grey osier thrives vigorously on fenny lands; is very hardy and tough; and, having a white glossy surface, is peculiarly adapted for cradles, and the finer kinds of basket-work.—The other varieties of this class vegetate in the dampest soils, and flourish even on the most barren kinds of peat; but, being coarse, brittle, and decaying speedily, they will not answer the expence of planting, unless in the vicinity of navigable canals: besides, they are fit only for the coarsest baskets and hampers; and will not pay the expence of land-carriage.

To the *second* class belong:

1. The *Welch* Osier, which is both red and white, and was originally cultivated in Wales. It forms an useful part of a plantation; being well calculated for tying the bunches or bundles after the rods have been peeled and bleached. Nor is it less serviceable for binding bundles or sheaves of reeds for thatching; though it is extremely bitter, and refused by every kind of cattle, unless the animals are compelled to eat it from hunger.—The Welch osiers are very pliant and tough; and, if they could be perfectly bleached, would not be inferior to the best sorts, for manufacturing baskets. Rats have a particular aversion to this variety; and, though every other species of bandage be subject to their devastations, they never touch those bundles which are tied with Welch osiers:—the application of this practical fact, to the purpose of expelling those depredators from granaries, deserves the attention of farmers and corn-dealers.

2. The *West Country Spaniard* is thus denominated; because it was first introduced into the western counties of England, from Spain. This variety flourishes in every soil, and attains a considerable size; its bark being of a blueish-grey colour. Although it does not thrive so luxuriantly as the Welch osiers, yet Mr. PHILLIPS deems it worthy of cultivation; having ascertained by experience, that one acre of land will more fitly contain 14,000 plants of the Spanish kind, than 12,000 of the next following.

3. The *New Kind*, is a variety generally known and cultivated. It is divided into two sorts, viz. the *best*, and the *inferior* new kind: the bark of the former is of a light-brown shade, while that of the latter resembles rusty iron, having light longitudinal streaks, whence it has received the appellation of *Corderoy*. This variety flourishes on *mellow* land: on account of its luxuriant vegetation, it requires considerable space to receive nourishment, and the influence of the sun; so that the number planted seldom exceeds 11,000 per acre.

4. The *French Osier* is the most valuable of the numerous varieties. It is preferred to every other, for making the smallest and finest baskets, hats, fans, and other light articles: for which purposes considerable quantities were imported a few years since from France,

Holland, and Flanders; because the manufacturers could thus obtain them at a cheaper rate, than if they had been planted in England. The French osiers are of slower growth, than any other sort of this shrub: hence planters are not inclined to cultivate them; as the small profits are inadequate to the ground-rent and price of labour in England. This variety, nevertheless, deserves to be reared; for it is extremely pliable, tough, taper, *close-grained*, and durable: though it be less profitable to the cultivator, it is certain of meeting with a more ready sale. Besides, considerable sums of money, which must otherwise be carried out of the country, would thus be annually saved to the nation, and employment might be furnished to numerous indigent families.

Osiers are propagated by planting *slips* or *foot-sets* in wet or marshy situations: they should be put in the ground shortly after Christmas; because the plants will be less liable to fail, than if the setting were deferred till the end of April, or the commencement of May. When the soil is sufficiently dry, it will be advisable to scatter a small quantity of cole-seed, or with more advantage, turnip-seed, that will serve as a shelter to the young plants; but either of which ought to be grazed with sheep about Michaelmas; because it will then grow so large as almost to choak the osiers. In the course of three or four years, they will have attained a size sufficient to be cut, and formed into bunches or bundles, by compressing them in an iron hoop of one ell in circumference: eighty of such bundles constitute a load, the price of which varies from 12 to 14l. The best soil usually produces *one load per acre*; but, on an indifferent or poor ground, half a load is computed to be a tolerably good crop.—The rent of the land, upon an average, is from 20 to 25s. per acre; and the expence of weeding, renewing, cutting, and peeling, such a plantation, is estimated at about 5l. if the work be well executed. Some careless cultivators, however, suffer the ground to be over-run with weeds, in consequence of which the value of the crop is necessarily diminished.

OSMUND ROYAL, FLOWERING FERN, or ROYAL MOONWORT; *Osmunda regalis*, L. an indigenous plant, growing in watery places and boggy marshes; bearing flowers in the months of July and August.

It is remarkable, that impressions of the leaves of this vegetable are frequently met with in the nodules, or small masses of ironstone found in the mines at Coalbrook Dale.—The root of the Osmund Royal, boiled in water, affords a thick mucilage, which, in the North of Europe, is employed as a substitute for starch, to stiffen linen.—On account of its viscid, sub-astringent nature, it was formerly often used in the gout, as well as in the rickets. It appears, however, to be better calculated for external applications, in contusions and bruises, of which, it is said, to be a powerful discutient:—as it smoothens and softens the skin, it makes a tolerable cosmetic; and is reputed for its property of dispersing freckles, and other pimples from the face.

OSTRICH, or *Struthio Camelus*, L. the largest of the feathered tribe, and a native of Africa and Arabia. It is usually six or seven, and sometimes eight or nine feet high from the top of the head to the ground; and measures seven feet in length, from the beak to the point of the tail.

The plumage of these birds is, in general, black and white, though sometimes grey; the sides, thighs, and coverts of the wings, are destitute of feathers; the thighs being very large, fleshy, and covered with a reddish-white skin.

Ostriches are remarkable for the uncommon swiftness with which they run, when pursued; their wings being too short for flying: two persons might easily ride on the back of this giant-bird, if it were properly trained. The female lays several times in the year from 20 to 30 eggs, which are hatched in the sand, and weigh from three to four pounds each; they are very nourishing, but of a taste less agreeable than that of hen's eggs. Hence these prodigious birds are chiefly valuable on account of their soft downy feathers, employed in the manufacture of military plumes; and which pay on importation, if dressed, the sum of 9s. 8½d. per lb.; if undressed, they are subject to the duty of 4s. 10½d. per lb.

Ottar of Roses. See Roses.

OTTER, the Common, or *Mustela lutra*, L. an amphibious animal that inhabits Europe, North America, and Asia; it is, in general, about the size of the badger (which see), but has shorter legs; and its five claws are connected with a web-like membrane.

Otters display great sagacity in forming their habitations; they burrow under ground in the banks of rivers or lakes, making the entrance of their hole beneath the surface of the water; they also construct several other apartments, to which they retreat in case of high floods. These quadrupeds prey on fish, frogs, aquatic rats, lobsters, and other insects living in fresh waters; but they are exceedingly destructive in fish-ponds.—Their rutting season is in February, and the female produces three or four young ones in the month of May.

The skins of otters afford a very fine fur, of a deep brown colour, which, in winter, acquires a darker shade, and sells at an advanced price.—Dogs spontaneously chace these animals, and easily apprehend them, when at a distance from water, or their subterraneous dwellings; this pursuit, however, is attended with great danger to the former; as the otter, when seized, defends himself with such force as to break their leg-bones, and never quits his hold but with the loss of life.

Less valuable than the skin, is the flesh of otters; though we learn from Bechstein, that it is occasionally eaten in monasteries and cloisters, during Lent: from its strong fishy nature, such food is almost indigestible.

OVEN, a kind of domestic furnace, used for baking bread, pies, tarts, &c.

Ovens are generally constructed of brick-work in a semi-circular form, with a very low roof, and the bottom of which is laid with stone: in the front is a small aperture and door, by the shutting of which, the heat is confined while the bread is baking. They are usually heated by means of dry faggots, wood, &c. As these ovens, however, are not calculated for small families, on account of the quantity of fuel they consume, others have been contrived, on a more diminutive scale: these are usually formed of cast or hammered iron, and may be heated by the same fire which serves for the cooking of other provisions.

Among the ovens of this construction, that of Mr. Powers, who obtained for it a patent in 1801, deserves to be noticed. It is formed of iron, so as to be portable, and may be conveniently conveyed to any distance, at the option of its possessor; but, as the reader cannot form a distinct idea of this contrivance, without the aid of an engraving, we refer him to the 14th vol. of the *Repertory of Arts*, &c. where the patent is described, and illustrated with a plate.

In the year 1800, the Society for the Encouragement of Arts, &c. conferred a bounty of 15 guineas on Mr. S. Holmes, for his invention of an oven, which is heated without flues. The whole consists of a cast-iron oven, from the side of which a solid piece of that metal projects into the fire, where it constantly remains; and, on becoming red-hot, communicates to the whole oven a degree of heat sufficient for baking bread, while it at the same time assists the fire in roasting meat.

In the common iron ovens, the heat is communicated by means of flues, which waste a considerable part of the fire in its passage, and likewise require much labour to keep them of an uniform heat. The contrivance last alluded to, is intended to supply this and other inconveniences: and Mr. Holmes states, that his oven uniformly remains at a baking heat, without any additional expence, or trouble. We understand, however, that such improvement is by no means *new*; and that a similar method of saving fuel, has for several years been practised in the West of England.

OVER-REACH, in farriery, signifies a wound upon the coronet, towards the back part of the foot, or heel of a horse: it is occasioned solely by striking the sinew of the fore-heel with the toe of the hind-shoe on the same side; in consequence of which the animal halts, or walks lame.—See Halting.

Young horses are very apt to cut their heels when travelling; as their hind-foot moves in the same direction with the fore-foot; and as they are generally too spirited in their first excursions.

Although an *over-reach* is a wound of the complicated kind, yet it is not attended with danger, provided proper applications be made, to induce a suppuration. For this purpose, the most efficacious external application will be a proper poultice:—take oatmeal, or coarse wheaten flour; digestive ointment (prepared of equal parts of common turpentine and hog's-lard), two ounces; beer-grounds a sufficient quantity. This may be repeated at least twice in twenty-four hours, till the wound be well digested, smooth, and free from cavities, or excrescences of proud flesh. Next, the surface of the bruised part should be sprinkled over with the following mild escharotic powder:—Take of burnt lime-stone slaked in the open air, three ounces; and Armenian bole, one ounce: triturate these ingredients in a mortar, and pass them through a fine sieve.—After sprinkling the wound with this powder, a pledget of dry lint may be laid gently over it; and, when the surface of the contusion is nearly equal with the skin; the powder alone will be sufficient to effect a cure.

Ounce. See Weight.

OWL, the Common, or *Strix flammea*, L. a well-known British bird, the elegant plumage and other good qualities of which, amply compensate for the ugliness of its form.

This species of the owl may be considered almost a domestic bird: it inhabits, during the greater part of the year, barns, hay-lofts, and other out-houses; where it is as useful as the congenial cat, for clearing those places from predatory vermin, especially mice. Towards twilight, this bird quits its perch, takes a regular circuit round the adjacent fields in quest of prey, and speedily returns to its usual abode. It may be easily distinguished by a hooting and snoring noise; but, when on the wing, it utters the most frightful screams. From the peculiar structure of their eyes, owls enjoy a very distinct vision in the dawn, or evening; though, in a dark night, they can see no more than other animals.

As the young of these birds keep their nest for a considerable time, and are fed long after they can fly, hundreds of mice become necessary for supplying them with food. Hence, their breed ought, by every possible means, to be encouraged. Besides, they may be employed with great advantage for decoying other birds, particularly crows, that are easily attracted by the uncommon figure of the owl, the beak and legs of which are singularly covered with downy feathers.

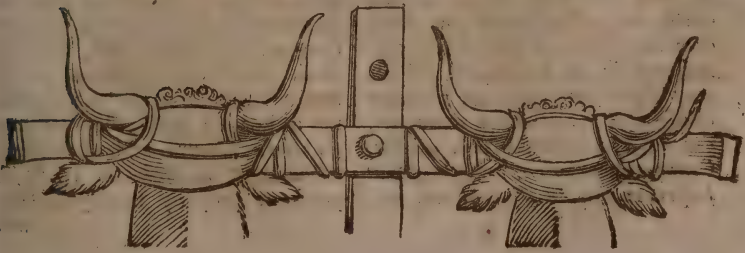
Owler. See Alder.

OX, a general appellation for male black-cattle; but which strictly denotes a castrated bull.

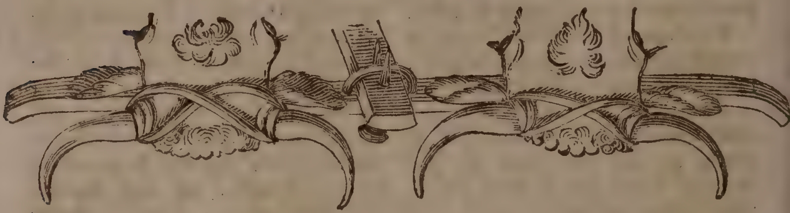
Having already treated, under the heads Bull, Cattle, &c. of the best mode of feeding and fattening oxen; and shewn their superiority over horses, in p. 483 of our 2d volume; we shall confine our observations, in the present article, to the most advantageous way of harnessing and managing them, as beasts of burthen, or Draught.

The principle of draught depends, as Lord Somerville has justly observed, on the joint power of the neck and base of the horn. This object is effected in *Portugal*, by a long leather strap, which is wrapped round the yoke; thence round the lower part of the horns; and is again fastened to the yoke. Thus, the heads of oxen become more steady in performing their work, and the animals themselves are rendered more tractable.

Another mode of working oxen, is that termed, *by the head*, which is practised in *France*, and represented in the following Cut:



To afford a more complete idea of the manner, in which the French oxen are fastened to the bow, we have added an accurate *front-view* of the upper part of the animals' heads ; as such method, in the opinion of Lord SOMERVILLE, is the best preparatory step towards introducing that practised in Portugal.



This method was a few years since introduced into Ireland, by Lord SHANNON, with complete success ; two oxen thus harnessed, being able to draw with great ease *three tons* in weight.

The most valuable breeds of these animals for draught, in this country, are those of Sussex, Devon, Herefordshire, Glamorgan, and Pembrokeshire ; which, on account of their large size, are well calculated for labour, and justly preferred in those counties, to cart-horses. The Sussex oxen have *beaten* horses at plough, in the deepest clays ; and those of Herefordshire are reputed to be superior in long journies, for conveying chalk, or similar heavy materials, over a hilly and flinty country. Although some prejudiced persons may object that oxen are unfit for draught in mountainous situations, yet let it be remembered, as Mr. COMBER pertinently remarks (*Real Improvements in Agriculture*, &c. 8vo. 1772, 1s. 6d.) that in such instances, " no *draught* be can *well* used ;" and that the descending of steep hills is in all respects as hurtful to horses as to oxen.—The Devonshire cattle walk with uncommon speed ; and, if four or five horses can till 100 acres of land, the same work might doubtless be managed equally well by a similar number of the Devonshire or Herefordshire breeds, if they were trained and fed (particularly with a view to *speed*) with the same care as horses : the farmer would also save a considerable part of the expence in their food. For though, after being very hardly worked, they require a little corn, yet their *keep*, in all other respects, is much cheaper (see vol. ii. p. 483) ; and, if *well-shod*, they will perform every kind of draught in the same manner as horses : lastly, they will *pay for their labour* ; and, after being moderately worked, for 10 or 12 years, if properly managed, they will leave all the profit of their growth, in *clear gain* to their owners. Besides, should an ox, from any unforeseen accident, be lamed, or become blind or old, he may be fattened, and sold at any time for a larger price than he originally cost; because these animals uniformly feed in a more *kindly* manner, and sooner grow fat, after they have been worked for several years.—On the contrary, the value of a horse decreases, after he attains the age of seven years; and, should any accident happen, he becomes utterly useless.

Oxen, then, being of extensive and permanent utility, deservedly claim every attention from the humane and unbiassed husbandman, particularly with respect to *shoeing*; as they will thus be enabled to walk and draw, both with greater speed, and with superior effect, when carefully shod. This operation is usually performed by *casting* them on their backs, when the farrier proceeds to affix the shoes, in a manner similar to that practised on horses. By such attempts, however, they are liable to numerous accidents; for the prevention of which, an ingenious machine has been contrived, in order to secure the animal by means of short posts. On these, the fore or hinder legs are fastened according to circumstances; and thus the shoes are applied, so that it is almost impossible to injure the helpless creature. The curious reader will find two neat engravings of this useful contrivance, in the 26th vol. of *Annals of Agriculture.*

Before we conclude this article, we shall mention the ingenious *Circular Ox-Stalls,* erected by the late Mr. HUTCHESON MURE, at Saxham, in the county of Suffolk; and which, we conceive, deserve to be more generally known. —The structure contained forty-six beasts: the cabbage-carts entered at the opening in the circle; and, going round in the area, distributed the allowance of food to each animal directly into the manger, at the heads of the oxen: their dung being piled up in a circle round the whole building, formed a kind of wall, that afforded a convenient shelter to the cattle. For a minute account of this ingenious contrivance, the reader may consult the 31st vol. of the practical work above quoted, where it is also illustrated with an engraving.

OX-EYE CHAMOMILE. See vol. i. p. 491.

OX-HEEL. See HELLEBORE, the Fetid.

OX-EYE, the GREAT WHITE, GREATER DAISY, MOON-FLOWER, CORN MARIGOLD, or DAISY GOLDINS; *Chrysanthemum Leucanthemum*, L. an indigenous plant, growing in dry meadows, pastures, and on walls: it flowers in the months of June and July.

The young leaves of this vegetable may be eaten in salads.—Horses, sheep, and goats relish this plant; but it is refused by cows and swine.

BRADLEY recommends the culture of this elegant flower, by dividing the roots, and planting them on the largest borders of gardens, three inches deep; as it grows quickly in any soil, but must be watered as soon as planted.

DIOSCORIDES assures us, that the leaves of the great white ox-eye, when bruised, afford a good application to cold schirrous tumors; and that a decoction of them, if taken by persons subject to the jaundice, immediately after coming from the tepid bath, will tend to restore their natural colour:—we have had no experience of its medicinal effects.

OX-TONGUE, the COMMON, or LANG-DE-BOEUF, *Picris echioides*, L. an indigenous plant, growing on the borders of corn-fields, and flowering in the months of July and August.—When young, this vegetable affords an agreeable potherb; its juice is milky, and not too acrid.

OXYD, a term, in the antiphlogistic system of chemistry, denoting those compound bodies which are formed by the decomposition of *oxygen-gas*, either by means of metals, or certain other substances.

All *oxydes* are the basis of some metallic bodies, the most remarkable of which, were formerly known under the name of *calces* (or *magisteries*, if dissolved in acids), and have received their present appellation from the acidifying principle which they are believed to contain.

Metals are converted into *oxydes* by combustion, and by solution in acids: but, many of them acquire this form, by the action of the atmosphere alone; though they assume it with greater facility, when the latter is aided by moisture.—During the process of conversion into oxydes, metals are divested of their lustre; and, after increasing considerably in weight, they exhibit an earthy appearance.—Speculative chemists have, therefore, lately conjectured, that all earths are metallic oxydes, and that they are all susceptible of reduction to a metallic state, provided there be any matter for which oxygen has more powerful elective attraction than that, by which it is kept in combination with the bases of such supposed oxydes. As this opinion, however, is unsupported by actual proof, it cannot be admitted in the present system of chemistry.

OXYGEN, is a term invented by the French chemists, and at present employed to express the acidifying principle.

Oxygen is considered as an elementary *something*, utterly incapable of decomposition; nor will it admit of being exhibited by itself, or of being produced in its simple state: for, at the moment of its becoming free, it unites with the *light*, and *caloric*, or heat of the surrounding medium, and thus forms what has been severally denominated *vital-air*, *fire-air*, *dephlogisticated* or *pure-air*, and lastly, *Oxygen-gas*. The peculiar character of this elastic fluid was first developed by Dr. PRIESTLEY, whose experiments have been confirmed, and the properties of gas-oxygen fully explained, by LAVOISIER, CAVENDISH, and other illustrious chemical philosophers.—From their discoveries it appears, that this uncompounded invisible matter can be known only in its combinations; that it forms a constituent part of the atmospheric air, in which it exists in the proportion of 27 or 28 parts to 100.

Farther, oxygen may be separated not only from the atmosphere, but also from water; from all acids; and also from vegetables exposed to the rays of the sun. By this natural process, a considerable portion of it is evolved from the leaves of plants during their perspiration, in consequence of solar heat: thus, when oxygen is carried

ried to their roots, by means of the circulating fluids, it is believed to promote their growth; though, if it be absorbed too copiously, and rapidly, it is unfavourable to vegetation. On the contrary, a very large proportion is requisite to conduce to the growth, and to nourish the vitality of animals.—Lastly, oxygen is supposed to exist in all bodies, whether of the vegetable, animal, or mineral kingdoms, and particularly in certain metallic calces or oxydes; such as ruddle, calamine, and burnt clay; which, on account of the large quantity of the acidifying principle they contain, are conjectured to be of considerable utility as manures.

OXYMEL, in pharmacy, a mixture of honey and vinegar, which are boiled to the consistence of a syrup.

Oxymel of Garlic, is prepared by boiling, for a short time, half a pint of vinegar together with two drams of caraway, and a similar quantity of sweet fennel-seeds, in a glazed earthen vessel; when an ounce and a half of garlic, cut in slices, should be added, and the whole closely covered. As soon as the mixture becomes cold, the liquor must be expressed, and mixed with ten ounces of clarified honey, by the heat of a water-bath. This preparation is sometimes taken in the humid asthma, for promoting expectoration, and the fluid secretions; being a medicine of considerable efficacy, though it acquires an unpleasant flavour from the garlic.

Oxymel of Squills, consists of three parts of honey, and two parts of vinegar of squills, which are boiled in a glass vessel to the consistence of a syrup. It is an useful expectorant, and resolvent in asthmas, coughs, and similar complaints, when the patient is oppressed with viscid mucus: it is generally given in doses of two or three small tea-spoonfuls, together with a little cinnamon, or other aromatic water, to prevent the nausea which it frequently excites. In larger doses, it may be occasionally administered as an emetic.

OYSTER, or *Ostrea*, L. a genus of shell-fish, comprising thirty-one species, which are distinguished chiefly by the peculiar formation of their shells.—The principal of these is, the Common Oyster, taken at the mouth of rivers, in clear waters, on the eastern coast of Britain. Among the most esteemed for their delicious flavour, are the Malden and Colchester Oysters, caught in the Pent-Burnham, Malden, and Colne waters; or near the mouth of the Thames, which last are said to rival those of Colchester.

Oysters cast their spawn in the month of May, when they become subject to a periodical affection; the male-fish, having a black substance in the fin, is *black-sick*; and the female oyster, from a milky-juice in its fin, is said to be *white-sick*: in June and July they begin to recover; and are in August perfectly sound.—They are saltish in the pits, more saline in the beds or layers, and very salt in the sea.

These shell-fish should be fresh, tender, and moist; as the want of fresh water renders them hard, bitter, and unpalatable.—Epicures give the preference to such as are edged with a small brown fringe, or beard, and which they erroneously suppose to be females. It is equally absurd to conclude, that the fine green observed in oysters taken from artificial beds, is the effect of copperas; as this substance, or a solution of it, is inevitably fatal to all fish.

Oysters are esteemed as excellent food, and are eaten both raw and dressed, in various ways: in a fresh state, however, they are doubtless preferable; for, by cooking, they are in a great measure deprived of their nourishing jelly, and of the salt-water which promotes their digestion in the stomach. Hence *raw* oysters may be used with equal advantage by the robust, the weak, and the consumptive. Independently of the nutritive effects peculiar to this shell-fish, it generally tends to open the bowels, especially if a certain quantity be swallowed at one meal: hence to persons of a costive habit, they afford a *dietetic supper.*

The shells of the oyster, like those of other crustaceous fish, are composed of calcareous earth, and animal glue. They possess no medicinal virtue superior to common lime-stone or chalk; but, by calcination, they yield a quick-lime, which is perfectly free from any metallic or other fossile substance; and being less permeable to water, when mixed with sand, it is better calculated for the plastering of walls in damp situations. Hence the Dutch prepare their excellent mortar generally of marine shells burnt into lime; which makes a most durable cement. The great importance of this fact, in point of health and economy, deserves equal attention; so that the immense quantities of oyster-shells annually thrown away in London, Bristol, and other populous places, might easily be converted into a very useful *shell-lime.*

P.

PADDOCK-PIPE. See HORSE-TAIL, the Marsh, vol. ii. p. 493.

PADDOW-PIPE. See MARE'S-TAIL, the Common.

PAGIL, or Paigles. See COW-SLIP, the Common.

PAINT, a term used to express more particularly the preparations employed in painting houses.

The principal article in the various compounds being *white-lead*, the grinding of which is extremely detrimental to health, we shall state the following process, lately invented by M. A. A. DE VAUX, and communicated for the benefit of the public;—should it prove to be an effectual substitute for the pernicious paint now employed, it will be of inestimable service to society. He directs two Paris pints of *sweet* skimmed-milk (two quarts English measure); six ounces (6½ ounces English averdupois) of fresh slaked lime; four ounces of nut, caraway, or linseed oil, and three pounds of Spanish white, to be used in the composition. The lime must first be introduced into a stone vessel, to which should be added such a proportion of milk as will produce a mixture resembling thin cream. Next, the oil is to be gradually poured in; the whole being gently stirred, and the remainder of the milk added. The Spanish white must next be crumbled in, or scattered on the surface of the fluid, which it gradually imbibes, and at length sinks; when the whole should be briskly agitated.

M. DE VAUX observes, that the milk ought not to be *sour*; because, in such case, it would form with the lime a calcareous *acetite*, which strongly attracts moisture. Either of the oils above-mentioned may be used; but, if white paint be required, that of caraways is preferable; as it is perfectly transparent.—In order to obtain a *distemper* or *size*-colour, the paint thus prepared may be tinged with levigated charcoal, yellow-ochre, &c. for painting with which, the most common oils may be used.

The quantity here prescribed is, farther, stated to be sufficient for the first coat of six *toises*, or from twenty-four to twenty-seven square English yards: it may be applied in the usual manner; and costs in Paris the sum of nine sols, or 4½d. sterling.

PAINTING of the Face, is a prostitution of the human countenance, too absurd to be described.—See COSMETICS, and WASHING.

PAINTINGS. See PICTURES.

PALATE, or the organ of taste, consists of that flesh which composes the roof, or the upper and inner part of the mouth. It has a similar structure with the gums, but a greater number of glands, situated in the posterior part near the UVULA (which see), and secreting a mucus that serves to lubricate the mouth and throat, as well as to facilitate deglutition, or the act of swallowing. These glands have a great number of apertures for the discharge of the secreted humour into the mouth: hence it will be understood that, if the stomach, or the glandular system, be in a disordered state, the palate likewise will become corrupted; and, that persons who continually stimulate their appetite with heating drugs, spices, liquors, &c. cannot expect to possess either a *natural relish* for plain and wholesome food, or a good digestion.—See MASTICATION.

For the cure of a vitiated palate, we cannot suggest a better remedy than *temperance*, and occasional *abstinence*. If, however, the mouth be affected with an unpleasant taste, especially in the morning, it generally originates from a foul or diseased stomach, which ought to be previously restored to its healthy state. As a palliative, or temporary remedy, we recommend frequent gargling and rinsing the whole mouth with infusions of aromatic herbs, or common tea slightly acidulated, or even toast and water; a practice equally conducive to health and cleanliness.—See also TEETH.

PALES, denote planks or pieces of larch, oak, or other hard wood, which are driven into the ground, and serve as a fence for parks, paddocks, gardens, and similar inclosures.

As pales are exposed to all the vicissitudes of the weather, in consequence of which they often rapidly decay, a proper method of rendering them more durable, is an object of importance to landed proprietors. With this view, the following varnish has been recommended:—Let any portion of tar be ground with as much Spanish brown, as it will bear without becoming too thick, to be applied in a manner similar to paint. The mixture must be laid on the wood by means of a large brush, and the work kept as free from dust and insects as possible, till the varnish be perfectly dry: thus, if the wood be smooth, it will acquire an excellent gloss, which preserves it against the injurious effects of air and moisture. Being not only cheaper, but drying more speedily, it is far preferable to paint; and may be advantageously applied to all other wood-work that is exposed.—Should the glossy brown be disliked, a greyish-brown tinge may be imparted to the work, by mixing a small quantity of white-lead, and ivory-black, together with the Spanish-brown.

PALM-TREE, or DATE-TREE, *Phœnix dactylifera*, L. a native of Syria, Palestine, Egypt, and other hot climates, where it grows to the height of 100, and even 150 feet.—As it will not flourish in this country, we shall confine our account to the properties of its fruit.

Dates resemble in form the largest acorns, but are covered with a thin, semi-transparent, yellowish membrane; containing a fine soft saccharine pulp, of a somewhat vinous flavour; and within which is inclosed an oblong, hard kernel. They afford, when fresh, a very wholesome nourishment, and possess an agreeable taste. The best are obtained from Tunis, in a half-dried state, and pay, on importation, the sum of 2l. 10s. 10½d. per cwt. If chosen for medicinal purposes, dates should be large, full, fresh, and yellow on the surface; being soft, tender, and not too much wrinkled; have the full flavour; and, when shaken, they ought not to rattle. Formerly this fruit was often used in pectoral decoctions; and, beside its demulcent properties, was supposed to possess a slight degree of astringency.

There is an oil prepared from the fruit of this tree, known under the name of *palm-oil*; which is imported from the West Indies, whither the tree has been transplanted from Africa. It is of an orange-colour, and of the consistence of ointment; emitting a strong agreeable odour, but having very little taste: both of which it entirely loses by long keeping; when it becomes unfit for use.—On the Coast of Guinea, this oil is said to be used by the inhabitants as a substitute for butter. In Britain, however, it is chiefly employed externally, for mitigating pains, cramps, and similar affections: it is likewise used for the cure of chilblains; and, if early applied, has often proved successful.

PALPITATION OF THE HEART, a violent and irregular action of that muscle, accompanied with great uneasiness and oppression of the breast.

This affection is obvious from the vehement pulsation of the heart against the breast, which is sometimes so great, as to be audible at a distance. It chiefly affects persons of sedentary occupations; those, whose periodical bleedings have suddenly ceased; and also, hypochondriac, hysteric, and scorbutic patients.

Palpitations of the heart originate from various causes; such as mal-conformation of that organ, or of some of the large vessels; wounds, abscesses, and ossifications in the vessels near the heart; all of which are *incurable*. It may likewise proceed from plethora; from fear; and from spasmodic affections.

Cure. If the patient be of a full habit, venesection will produce immediate relief; after which he ought to drink, liberally, weak and warm liquors; and to take moderate exercise in the open air. The first passages should likewise be cleansed, by means of infusions of rhubarb, and senna, or similar mild laxatives. Clysters will also be found occasionally serviceable: and considerable benefit has been derived from frequent bathing of the feet in warm water.—In spasmodic cases, where the palpitation is induced by HYPOCHONDRIAC AFFECTION, HYSTERICS, &c. it may be relieved by employing the remedies pointed out, under the respective heads of those disorders.

PALSY, or *Paralysis,* a disease in which the patient is partly deprived of the power of voluntary motion; and which is often attended with sleep. One of the most frequent forms of the palsy is that, in which all the muscles on one side of the body are attacked, when the disorder is called a *hemiplegia.* If the power of motion and sense of feeling in the lower half of the body be impaired, the complaint is denominated *paraplegia.* Sometimes, also, it affects the tongue, lips, or other parts, in which cases it is termed *Local Palsy.*

Peculiarities: All the varieties of this complaint, more generally appear in the aged than in the young and robust:—the left side is in most instances the seat of the disease. Its hereditary nature is evident, from cases in which the fingers have been found paralytic from the birth; and it has also, though seldom, assumed a periodical state.

Causes: Palsies are induced by whatever prevents the nervous power from acting on any particular part of the human frame. The more remote causes are, intoxication, the immoderate use of tobacco, coffee, or tea; chronic rheumatism; wounds of the brain, or spinal marrow; suppression of customary evacuations; extreme coldness or dampness of the atmosphere; and indulgence in any of the violent passions: to these may be added, the inhaling of the noxious vapours of lead, quicksilver, or arsenic; or the injudicious medicinal use of those minerals, &c.

Persons liable to APOPLEXY, are peculiarly disposed to the attacks of palsy; and likewise such as lead sedentary and luxurious lives, or who are often engaged in intense studies during the night, or have suffered great distress and anxiety, are frequently subject to this malady.

Cure: As paralytic strokes often occur without any previous symptoms, though the patient generally feels a considerable degree of languor, restlessness, and giddiness in the head, it will be advisable to pay the greatest attention to the nature of the disorder, and immediately to consult a professional man. In young and plethoric persons, the treatment must be similar to that pointed out in the sanguineous apoplexy (vol. i. p. 82): but, if blood-letting become necessary, small quantities only should be drawn at one time; beside which, stimulating blisters ought to be applied, and brisk purgatives administered.—In the aged or decrepid, a contrary course must be adopted: the parts affected ought to be rubbed either with the flesh-brush, or with the hand; blisters, warm plasters, and volatile liniments, should likewise be employed. Considerable advantage has, sometimes, been received from electricity, the shocks of which must be directed to the diseased part, from a blunt wooden point; and be repeated daily, for several weeks.

Should the palsy be consequent on apoplexy, it must be treated according to the directions given for apoplectic fits: if it arise from rheumatic affection, it may, generally, be relieved by similar management with that to be followed in the RHEUMATISM. In palsy, originating from mineral exhalations, it will be useful to resort to warm, nervous, and de-obstruent medicines; and to apply blisters to the part affected: but, if it be induced by the imperceptible inhalation of lead, we refer to the most appropriate method pointed out p. 75, of the present volume.

Lastly, when the violence of the disease is happily reduced so as to admit of the patient taking exercise, this beneficial practice should be cautiously and regularly pursued: he ought to avoid all cold damp air; to wear flannel next the skin; and, if possible, to remove into a warmer climate.

PANADA, or PANADO, a preparation consisting of bread boiled in water, and sweetened with sugar. It is often given as an article of diet to children, and invalids; but such dish ought never to be made of *new* or *ropy* bread; which cannot fail to be detrimental to the organs of digestion. Nor is it advisable to employ a large proportion of sugar on this occasion; as the mucilage contained in the bread, if combined with saccharine matter, is apt to cloy and oppress the stomach. Hence it will be proper to add a small quantity of salt; and instead of common bread, we would prefer a panada, consisting of macerated biscuits, without boiling them, and a very moderate addition of salt and honey.

PANIC, or PANICK-GRASS, *Panicum*, L. a genus of plants, comprising 97 species, five of which are natives of Britain; viz.

1. The *verticillatum*, ROUGH-PANICK, or KNEED-GRASS, growing in corn-fields, and on shady, dry, hillocks, chiefly in the vicinity of London; attaining the height of two feet; and flowering in the months of June and July.—It is eaten with avidity by sheep.

2. The *viride*, or GREEN PANICK-GRASS, which abounds in sandy corn-fields, and flowers in the month of July.

3. The *Crus-galli*, or LOOSE PANICK-GRASS (more properly Cock's-foot Panick), is found in wet corn-fields, in the environs of the metropolis, and flowers in the month of July.

4. The *sanguinale*, COCK'S-FOOT, or rather WILD PANICK with blood-coloured stalks; growing in corn-fields, near Guildford, Surrey; and also in the vicinity of London: it flowers in the month of July or August.—All the stems of this plant that lie near the ground, and are about 12 inches long, take root; so that each produces five ears and upwards:—though it is an annual, and seldom flourishes for any considerable time, it increases and spreads widely in gardens, where it is a very troublesome weed:—BECHSTEIN observes, that the Wild Panick, which, in its natural state, is an almost useless plant, may be cultivated with great advantage on a dry, loose, sandy soil. In such situations, it will produce oblong, smooth, yellowish and semi-transparent grains; which, after being divested of their husks,

afford an excellent ingredient in puddings; and may also be converted into flour and bread.

5. The *dactylon*, or CREEPING PANICK-GRASS, abounds on the sea-shores of Cornwall; is perennial; and flowers in the mouth of July or August. Its roots may be employed for the same purposes as those of the DOG'S-GRASS, to which we refer.

Although the different species of Panick are coarse grasses, when cultivated in a *rich* soil, yet we believe that few native plants deserve more the attention of those farmers, who possess large tracts of a light, *sandy* nature, where scarcely any other vegetable will prosper.

PAPER, a thin flexible leaf, which is generally prepared of vegetable substances, for the purposes of writing, printing, &c.

The original invention of paper being lost in the uncertainty of tradition and antiquity, we shall not enter into any disquisition, respecting those nations, among whom this valuable article was first manufactured; though the Chinese appear to have the strongest claims in point of priority: hence we propose to confine our account to the materials of which paper is actually made, as well as those substances, from which it may be advantageously procured.

In Europe, paper is manufactured chiefly of linen rags; which, after being sorted into different classes, according to their respective qualities, are first carried to a machine, called a *cutting-table*, where they are divided into minute pieces; and thence to an engine, denominated the *duster*; which is covered with a wire-net, and put in motion by machinery; so that, by the rapidity of its motion, it separates the dust from the shreds, and forces it through the wire.

The rags are now reduced to a pulp of a proper consistence for making paper: this operation is effected in mills, by the joint action of water, and cylinders provided with iron blades; after which the stuff is conveyed into a general repository, that supplies the vat or vessel, whence the pulp is drawn.

In order to *cast* this pulp into paper, the workman immerses in the vat a mould, composed of wire cloth, and furnished with a frame to retain the stuff: thus, he draws as much of the pulp as is necessary to form one sheet, on which he lays a felt for the purpose of absorbing the moisture; and thus he continues, placing alternately a sheet and a felt, till he has formed six quires of paper, which is called a *post*. When the last sheet of the post is covered with felt, the whole is pressed; after which the sheets are suspended on cords in an airy room to dry, and then to undergo the process of *sizing*. This is performed by plunging a few sheets together, and turning them, in a vessel full of *size*, which is prepared of the shreds and parings of tanners, curriers and parchment-makers; and into which a small portion of alum is thrown, before the sheets are immersed.

The paper is now carried to the drying-room; and, after being gradually dried, it is conveyed to the finishing-room; where it is submitted to the action of the press; selected; examined; folded; formed into quires of 24 sheets, and finally, into reams, consisting of 20 quires each.

Thus manufactured, it is called *writing-paper*; as it is adapted for this purpose by the process of sizing,

ing. There are, however, various other sorts, such as *blotting*, *brown*, and coarse papers, which will not bear ink without *sinking*. To these may be added, the different sorts of paper intended for *drawing*, *engraving*, and *printing*; which, though prepared in the usual way, are not sized so thoroughly as that designed for the pen.

Paper being an article of extensive utility, for literary, commercial, and domestic uses, many vegetables have been discovered, which may be advantageously substituted for rags.—In justice to those ingenious men, who *first* devoted their attention to this important subject, we shall only remark, that many schemes had been proposed, but none carried into effect, previously to the year 1751; when Guettard, in France, and, in 1765, Dr. Schaeffer, in Germany, published their experiments; and communicated to the world *new* specimens of paper, made of the bark, leaves, wood, straw, &c. of different plants, shrubs, and trees. Soon after that period, the works of M. de Villette, who described the properties and uses of different plants, were printed on paper manufactured partly from the *marsh-mallow*, and partly from the bark or rind of the *Lime-tree*, or *Linden-tree*: it deserves to be remarked, that the paper obtained from the former, was tolerably fine, and of a yellowish-green shade; that from the latter, was somewhat coarser, and of a reddish-brown cast; both were smooth, equally fit for printing and writing, but especially for drawing. Another French manufacturer, however, Levier De Lisle, has been erroneously considered as the original inventor of the art of converting raw vegetable matter into paper; though his specimens are said greatly to surpass those produced by Schaeffer, in Germany.—We shall here briefly enumerate the principal of those specimens; namely, from *nettles*, dark-green; from *hops*, dark-brown; from *mosses*, greasy or dusky-green; from *reeds*, light-green; from three species of the *conferva*, different shades of green, mixed with grey; from the bark of the *willow*, reddish-brown; from the wood of the *hazel nut-tree*, white as milk; from the bark of the *oak*, reddish-brown; from that of the *poplar*, somewhat lighter than the preceding; from the *osier*, nearly of the same tint; from the *elm*, somewhat darker brown; from the *burdock*, and the leaves of the *thistle* (chardon) a green and white spotted paper.

In conducting experiments with plants, the following remarks of Schaffer deserve attention:—The boiling of vegetable substances, or the wood itself, in alkaline solutions, with a view to soften them, and facilitate their conversion into a pulp, is of no service; as, notwithstanding such treatment for several hours, they not only remained hard, but likewise assumed a yellow cast, though they had formerly been white. Even immersion in pure water affects the colour of vegetables: hence it is most advisable to carry them as fresh and expeditiously as possible to the mill, to convert them into pulp; to draw the paper; and suspend the sheets to dry in an airy place. Though *lime-water*, if employed for macerating vegetables, that are to be made into paper without rags, facilitates the decomposition of the former; yet, at the same time, it imparts a *yellowish* cast to the paper: such discoloration, however, may in a great measure be obviated by long-continued washing of the materials in the engine, during their conversion into a pulpy mass. Plants of tender fibres, which are naturally soft and pliant, require no lime-water, especially when they are to be reduced in a fresh state; but, for those that are dry, hard, and of a woody consistence, lime will be indispensably necessary; as otherwise the paper manufactured of them, always remains brittle, and unlike that obtained from rags.

Among the different productions of the vegetable kingdom, which have been employed in the manufacture of paper (before any attempts to that effect were made in Britain), we shall enumerate chiefly the following:

1. *Cotton*, when treated in a manner similar to that practised with linen rags, affords an excellent paper, which is incomparably more durable, and better calculated for writing; on account of its uncommon whiteness, great strength, and fine grain: it was first invented in Greece; and at present forms a very extensive branch of the Levant trade.

2. The pith of the various species of *Thistle* have been employed with success by SCHAEFFER, who first decorticated the stalks of this plant, bruised them, extracted the inner spongy substance, and sent it in a fresh and sappy state to the mill: after being worked three hours, it afforded, without rags, a tolerably white paper. Dr. BÖHMER, however, observes, that the white *down* growing on the *Cotton-thistle (Onopordon Acanthium*, L.) might be more easily collected and usefully employed for this purpose.

3. The *Withen*, or *Sallow (Salix capreata*, L.).—In the year 1788, the Society for the Encouragement of Arts, &c. conferred their silver medal on Mr. GREAVES, of Mill Bank, near Warrington, for preparing 20 quires of paper from the bark of this tree. The quantity of the material employed, was about six cwt. which had been stripped off the twigs in the month of September; and two-thirds of which were *heckled* and dried, in a manner similar to hemp, so that it was reduced to one cwt.: the remainder was dried in its natural green state, by which it lost one half of its original weight. The heckled bark was then chopped small; worked in the usual manner, and produced eight quires of a finer kind of paper: from the other, Mr. GREAVES obtained 24 half quires of coarser paper; which, though not in all respects equal to that manufactured of linen rags, nevertheless "seems likely to answer some valuable purposes hereafter, when the mode of working raw vegetable materials, shall be better understood."—Mr. G. is of opinion, that paper may thus be obtained at one half of the expence usually incurred in the common mode of preparing it from ropes or rags; and that it will be more serviceable, when made of the bark and leaves in a *green state*.

4. *Hemp*, is one of the most proper plants for being converted into paper, provided it could be procured at a reasonable price.—DU HALDE informs us, that the inhabitants of Nangha, in Japan, macerate this plant in lime-water, beat it, and then immediately prepare their paper.—GUETTARD asserts, that the very *shaws*, and

other refuse from the stalks of hemp, may be made into a good and strong packing-paper. In order to improve shaws, they ought to be dried in an oven; when the small, woody particles should be separated, by beating them with thin sticks; next, the clean and pure material must be suffered to putrefy, and afterwards treated in a manner similar to old rags.—Fondi, an Italian author, relates, that from *shaws* alone, he obtained a paper resembling the finest sort manufactured in Holland, after exposing them to the open air, for a whole winter: thus, from time to time, a white pellicle appeared on the surface, till their woody substance is entirely decayed; this coat or skin should be occasionally removed, being one of the best substitutes for linen rags.—*Press-boards* have, in this country, always been manufactured of *shaws*; and we have no doubt but that the latter may be rendered subservient to more valuable purposes.

5. *Hop-bines*:—Dr. Schaeffer plunged them for fifteen minutes in boiling water, then separated the rind from the woody substance, cut the latter into small pieces, and sent it to the engine. After being worked eight hours, they became fibrous, pulpy, and were fit to be formed into paper: on adding rags, the sheets assumed a whitish appearance; but, without them, had a brownish shade, and were uniformly of a firm consistence.

6. The stalks of *Brown* or *Blue Cabbage*, when deprived of their external skin, macerated for twelve hours in lime-water, then reduced to a pulp, afford, with the 20th part of rags, a good white paper.

7. The dry down of the Cat's-tail:—See vol. i. p. 458.

8. The stalk of the *Mallow*, and particularly those of the *Alcea rosea*, L. from which a fine and white paper may be prepared, without adding any rags.

9. *Maize*: from the leafy husk of this fruit, according to Plancus, the most beautiful post-paper is prepared in an Italian mill, near Rimini.—Schaeffer made an experiment with the whole plant, and obtained a greyish paper; but, after steeping the pulp four days in lime-water, the sheets acquired a greenish shade.

10. From the woolly catkins of the *White Poplar*, Schaeffer also obtained an excellent smooth paper; having previously cut them into small pieces, and then submitted them for three hours to the operation of the engine: he remarks, that the pulp was easily drawn, formed into sheets, pressed, sized, &c. The paper made of the woolly substance produced by the Black Poplar, was grey, and neither firm, nor free from knobs.

11. The stalks of the *Common Broom*, after depriving them of the external rind, afford, without rags, a solid writing-paper.

12. The *Shaws of Flax*, together with other refuse from that article, have lately been used with advantage by the German paper-makers: it is well known, that the stalks of the flax-plant may be employed in their natural state for this purpose; but the expence would not be equivalent to the profit: hence the *shaws* ought not to be thrown away as useless.

13. The stalk of the *Common Sun-flower* (Helianthus annuus, L.) contain a large portion of a white, shining, fibrous substance, which, more than any other, deserves the attention of the manufacturer.

14. *Peat* has, at Erfurt, lately been converted into an useful wrapping-paper, paste-boards, playing-cards, &c. without the addition of rags:—we conceive, it would afford a good material for paper-hangings.

15. *Grass-wrack* (Zostera marina, L. vol. ii. p. 398) is with great advantage employed in North-Holland, where most of the packing-paper is manufactured of this marine vegetable.

16. The tendrils of the *Vine*, after having undergone the putrefactive fermentation, yield a beautiful paper.

17. The Common *Horn-beam Tree* (Carpinus Betulus, L. vol. ii. p. 479). The shavings merely washed, and submitted to the mill, were made into a tolerably white paper.

18. The stalks of the *Mugwort* (*Artemisia Absinthium*, L. vol. ii. p. 239), when soaked for several days in lime-water, and reduced to a pulp, were formed into a whitish writing-paper; but that produced from the external rind was fit for all the purposes of packing.

19. The stalks of the *Clematis*.—See Traveller's Joy.

20. *Barley-straw* is, perhaps, the most abundant and profitable material which might, in this respect, serve as a substitute. Dr. SCHAEFFER (whose inventions have not always been acknowledged by an ungrateful posterity) obtained a yellowish paper of this straw, after soaking it in boiling water, then steeping it in lime-water, and adding the 20th part of linen rags.

Having thus given an outline of the improvements and discoveries made in this useful branch of the arts, by ingenious men on the Continent, as well as in Britain, we were not a little surprized at the effrontery of those adventurers and ignorant pretenders, who have lately amused the world with their *new* invention of manufacturing paper from straw, and other vegetable productions. Indeed, we deem it a duty we owe to the public in general, and the British manufacturers of this important article in particular, to declare that, in our opinion, they are fully entitled to avail themselves of the different substances before described; even though a speculative person should screen *his* pretended method of making or re-manufacturing paper, under an exclusive privilege. If any doubt prevail respecting the *legality* of such application, the Editor of this work solemnly engages to prove, by the evidence of a respectable proprietor of paper-mills, in the vicinity of London, that these processes, for which his Majesty's patent, as well as an act of the legislature, have recently been obtained, were well known to him *previously* to both grants; and that he has actually procured specimens of paper manufactured of *raw* vegetable materials, in this country, about the middle of December, in the year 1799. Hence it follows, that the patentee is not entitled to the *sole exercise* or monopoly of his surreptitious privilege; and that every paper-maker in the United Kingdom, has a right to make use of the discoveries before stated.

In a late volume of the "*Annales de Chimié*," we meet with some useful hints relative to the manner of re-manufacturing the paper of old books (or even new ones of a certain description), or any letters, or other paper already used for writing or printing; by M. M. DE YEUX, PELLETIER, MOLARD, and VERKAVEN.

I. *Process for re-fabricating Printed Paper* :—All paper of the same quality should be collected, and separated from such as may have any writing on the pages; the edges of those leaves which may have become yellow, and also the backs of books, being cut off by the instrument used by bookbinders.—One hundred weight of paper is now to be put, sheet by sheet, into vats, sufficiently capacious to contain it, together with 500 quarts of hot water; but which ought to be filled about one-third: —the whole is next stirred by two men for the space of one hour, who are gradually to add as much water as will rise about three inches above the paper; after which it is left to macerate four or five hours; the agitation being occasionally repeated, so as to separate, and at length to form the paper into a kind of paste.

The water is now drawn off by means of pipes, and the pulp conveyed to the mill, where it is to be coarsely ground for one hour; at the expiration of which, it is boiled in a cauldron for a similar space, with a sufficient quantity of water to rise four or five inches above it. A short time before the mixture begins to boil, thirteen quarts of caustic ley of pot-ash are to be added to every cwt. of paper. The ley alluded to, is prepared by dissolving 100lbs. of pot-ash in 300 quarts of boiling water, to which are to be added 20lbs. of pulverized quick-lime; and the whole must be briskly agitated, till it become of an uniform consistence, when it is suffered to stand for 12 hours; at the end of this time it must be drawn off, and 75 quarts of boiling water added to the sediment, which being stirred for half an hour, and suffered to stand till it become clear, is to be mixed with the liquor first decanted.

When the paste has boiled in this ley for one hour, the fire is to be extinguished, and the matter suffered to macerate for 12 hours; after which it must be taken out, drained, put into bags, and submitted to the action of a strong press for a similar length of time, to deprive it of all moisture; and, if it appear white, so that the printer's ink be properly extracted, it may be re-manufactured in the usual manner.

II. *Process for the re-fabrication of Written Paper* :—The paper must be sorted; the yellow edges cut off; and the whole thrown, leaf by leaf, into a tub half-full of boiling water, where it is to be agitated as before directed. After it has macerated four hours, the water should be drawn off; a fresh quantity of boiling water added; and the mixture stirred for half an hour; at the expiration of which the paper is again left to dissolve for three hours.

The fluid is now drawn off, and 260 quarts of *cold* water poured on each cwt. of paper; which being perfectly mixed, 6 lbs. of oil of vitriol are to be gradually added; and the whole strongly agitated for a considerable time, that the paper may thoroughly imbibe the liquor.

This composition is next suffered to macerate for twelve hours; the agitation being occasionally repeated, when the tub is to be filled up with cold water; and the mixture again stirred, to wash the paper, which will now be reduced to a perfect paste. Lastly, after drawing off the water, the pulp must be put into bags, pressed, and ground in a mill; after which it is conveyed to the vat, and worked in the manner practised with linen rags.

In the year 1801, a patent was granted to Mr. Koops, for extracting ink from printed paper, and restoring it to its original state.—His process varies little from that above described; the paper being agitated in hot water, to extract the size, and reduce it into a pulp: next, the adhesion of the ink is to be removed by a caustic alkali prepared of lime and pot-ash, the quantities of which, should be proportioned to those of the paper. After discharging the ink, he directs the pulp to be bleached by means of the oxygenated marine acid, in the proportion of 10 or 12 gallons to 140 lbs. of the material; and, when sufficiently whitened, it is re-manufactured in the usual manner.—According to the patentee's account, *writing paper* does not require so large a proportion, if any, of the caustic alkali; but is bleached by confining it in a wooden box, rendered air-tight; into which the acid gass is thrown directly from the retort wherein it was produced.

The *staining*, or *dyeing* of *paper*, is performed by applying, with soft brushes, any of the colours used for tinging other substances, after tempering them properly with size or gum-water. Should the paper not be sufficiently hard to receive the tint without sinking, it will first be necessary to *size* it, or to employ a larger proportion of gum with the tinging matters. And, if the paper is to be of an uniform colour, the latter must be fixed by several thin coatings, each being suffered to dry, before another is applied; as the shade will otherwise appear unequal.

As writing paper is often imperfectly *sized*, in consequence of which the ink is apt to sink, it has been recommended to dissolve a small piece of Roman alum in a glass of pure water. This liquor should be gently spread over the suspected part, with a soft sponge; and, after becoming dry, it may be safely used for writing.—Should there be any occasion to write on a printed book, or on paper that is too fresh and moist, it will only be necessary to mix a little gum with the ink.—Lastly, in case any book or manuscript be stained with oil, or grease, it has been directed to calcine and pulverize the bones of sheep's trotters; and to apply a small portion of the powder to each side of the stain, which should be placed between two sheets of white paper, and the whole submitted for the space of twelve hours to the action of a press: if the stains do not disappear, the process should be repeated in a warm place.

Various patents have been granted for inventions, or improvements, in the different branches of the paper-manufacture; but, as the specification of them would benefit only a small part of our readers, we shall not enter into particulars:—the following, however, deserve to be noticed, namely: Mr. Hooper's, in 1787, for his invention of a paper for printing; and, in 1790, for making paper of different sorts from *leather-cuttings*;—Mr. Cunningham's, in 1794, for manufacturing paper from various materials;—Mr. Bigg's, in 1795, for a cheap and expeditious mode of bleaching paper;—and Mr. Carpenter's patent, obtained in the same year, for a new method of bleaching in the water-leaf or sheet.

Paper-Hangings, are a particular kind of paper, which is much thicker than that used for the purposes of printing, writing, &c.; so that it is manufactured solely for hanging or lining the walls of rooms. Such papers are coloured in various ways; but, as a description of these processes would trespass on our limits, we shall merely take notice of a patent, which was granted in 1793, to Mr. Eckhardt; for his method of preparing and printing paper-hangings in different patterns, and silvering them so as to resemble damask, lace, and various silk stuffs. The patentee directs the paper to be coloured in the usual manner, and a proper coat of size, consisting of solutions of isinglass, or parchment, to be applied. When this *ground* is sufficiently dry, a gold size, or other preparation, may be substituted, and laid on those parts, on which the ornaments are intended to appear. Before the gold size is perfectly dry, leaves of silver are spread over it; the paper is sized two or three times; and then finished with such varnish as will resist moisture.

To conclude:—As many accidents happen by the all-devouring element of fire, both to printed and written papers, as well as to hangings, when intrusted to improvident persons, we shall communicate a very simple, but effectual, method of rendering all sorts of paper *fire-proof*. Such desirable object may be easily effected, by immersing these combustible materials in a strong solution of alum-water; and, after drying them, repeating this immersion, if necessary. Thus, neither the colour, nor the quality, of the paper, will be in the least affected: on the contrary, both will be improved; and the result of the experiment may be ascertained, by holding a slip of paper so prepared over a candle.

PARCHMENT, the skins of sheep or goats, prepared in such a manner, as to be subservient to the purposes of binding books, the reception of ink, &c.

The wool is first stripped off the skins, which are plunged in a lime-pit for the space of 24 hours, then taken out, drained, and stretched on a kind of frame; when the flesh is scraped off by means of an iron instrument. Next, they are moistened with a wet rag, then sprinkled with pulverized chalk, rubbed with a pumice-stone, and afterwards with the instrument; when the skins are again moistened, rubbed with the pumice-stone, drained, and the iron instrument is passed a third time over them.—The *wool*, or *hair-side*, undergoes similar operations; and, the whole being carefully extended on the frame, the flesh-side is again scraped; when it is a second time sprinkled with pulverized chalk, which is afterwards gently brushed off, and the skin again suspended, that it may become perfectly dry.

The next operation is that of *paring*; when the skins are reduced to one half of their thickness; and rendered smooth by the action of the pumice-stone. The parings are consumed in making size, glue, &c. while the skin is employed for ingrossing deeds, and other purposes.

There is a finer sort of parchment, known under the name of *vellum*, which is prepared from the skins of sucking calves. It is manufactured in a similar manner with the first mentioned article, excepting that it is not immersed in the lime-pit.—A very excellent *glue*, or *cement*, may be obtained by boiling the small shreds of vellum, so as to convert them into a jelly; but care should be taken that no fragments of parchment be used, because the skins of goats and sheep are unfit for such purpose.

For a simple method of restoring damaged parchment, so as to render the writing on it legible, see the title DEED, in p. 128-9, of our 2d volume.

A patent was lately granted to Mr. HITCHCOCK, *for converting old skins of parchment or vellum into leather.*—Although we doubt the practical tendency of the patentee's ingenious, but complicated processes; yet, in the present instance, as they may be applied to other useful purposes, we shall observe, that he endeavours first to reduce the skins to their natural state, by washing them well and often in water for 24 hours; then removing them for a similar time to a bath composed of 1½ lb. of white vitriol, 1 lb. of cream of tartar, and 1 oz. of sal ammoniac, dissolved in 20 gallons of water. In order to soften their texture, and to discharge the lime, he adds to this liquor 10 lb. of oil of vitriol, 1 lb. of aqua-fortis, and one pint of spirit of salt; in which *acid bath* the skins are to be steeped only for a short time. After washing them properly, rinsing out all the acid, and completely wringing out the water, without tearing the skins, they are to be immersed and well soaked in a *tanning liquor,* composed of 20 lbs. of oak-bark, 7 lbs. of sumach, 5 lbs. of elm-bark, 3 lbs. of sassafras, and the same quantity of lignum-vitæ shavings mixed with 20 gallons of water, previously *warmed* (probably, *boiled),* for 12 hours, and cooled to the temperature of new milk, before the skins are immersed. Next, they are to be tanned in the common way, with oak-bark, or oak and sumach, then washed and dried. Lastly, to make the renovated leather *water-proof,* it should first be soaked for five or six days in linseed or nut-oil; and, after wringing out the superfluous oil, the skin ought to be repeatedly dressed with the following composition: Take 7 lbs. of nut, or linseed oil; red-lead, litharge, sugar of lead, white vitriol, bees-wax, resin, and pitch, 1 lb. of each: melt them together over a moderate fire.

PARENT, a term of relation applied to those persons from whom we derive our temporal existence.

The *moral* duties of parents towards their offspring, being a subject not immediately connected with our plan, we shall not enter into any ethical inquiry, but confine our attention to their *legal* duties; that is, such as they owe to their *legitimate* children, respecting their maintenance, education, and protection.

1. With regard to their *maintenance,* it is a principle both of law and nature, that every man is bound to provide for his offspring. The father and mother, and also the grandsire and grandmother of feeble and poor descendants, are obliged by the 43 ELIZ. c. 2, to support them at their own expence (provided they be able), in such manner as shall be directed by the quarter-sessions; and, if a man abscond, and desert his children, the 5 GEO. I. c. 8, directs the church-wardens and overseers of his parish to seize his property, and dispose of it for their relief. Thus, it has been wisely established by these

statutes, that if a mother or grandmother, who formerly was able to maintain the child, marry a second time, the step-father becomes chargeable with its maintenance; for, being their debt when single, it extends in common with all others to charge the second husband; but, as the death of the wife dissolves the relation, such duty then ceases to bind him.—No person, however, is compellable to support his issue, excepting the latter be incapacitated from labour by infancy, disease, or accident; in which cases, the former is obliged to provide them with necessaries, on penalty of paying 20s. per month to the parish, in case of refusal.

Farther, the law of England does not prevent a man from disinheriting his children by *will*; but, in conformity to the custom of London, the offspring of *freemen* are entitled to one-third part of their father's effects, which must be equally divided among them, and of which they cannot be deprived. Hence, too, heirs and children are peculiarly protected by courts of justice; lest they should be disinherited by any ambiguous or uncertain expressions; because it is necessary to prove, beyond the possibility of doubt, the testator's intention to deprive them of their right of inheritance.

2. The most important duty of parents, is that of *educating* their children, in a manner becoming their rank in life. And, though it must be confessed, that the law of England is deficient in this respect, yet it has also provided for the welfare of the rising generation; as, by the statutes for the apprenticing of poor children, these are to be taken from their parents, and placed by the churchwardens of the parish in such situations, as may render them most useful to the commonwealth.

3. The last duty of parents towards their offspring, is *protection*, which may be considered principally as a natural obligation; no municipal laws enjoining its observance. But, though a child be thus placed in the power of its parent, the latter cannot abuse such authority. He may exercise proper severity to keep his children in due obedience: thus, he may lawfully, and in a reasonable manner, chastise them; because such correction is sometimes necessary, and conducive to their improvement. This authority of the parent, however, extends only to the end of the child's minority, during which period the former is entitled to the benefit of the labour and assistance thus obtained, while the latter resides with, and is maintained by him:—a parent may likewise allow or forbid the marriage of his children, till they attain the age of twenty-one years. Now, the legal power of the progenitor ceases; because, the adults are enfranchised, by arriving at years of discretion, when the empire of the father, or of the guardian, is supposed to yield to that of reason.

PARISH-MILL. See MILL.

PARING OF LAND, an ancient practice in agriculture; but which has, within a few years, been exploded in various parts of Britain. It consists in cutting off *old* turf at such a thickness as the labourer can conveniently effect; together with the more recent turf, at such a depth as will render it sufficiently dry for BURNING.—See p. 396-7 of our first volume.

Paring is chiefly practised on breaking up land from a state of nature; though it is with advantage employed *periodically*, on cultivated ground. An instance of this fact occurs in the 24th vol. of *Annals of Agriculture*, where the industrious Mr. Boys states, that several acres of wheat, barley, oats, and sainfoin, were at that time growing on a soil, which had been repeatedly *pared* and *burnt*. He adds, that the crops were of sufficient value to buy the land at more than *forty years purchase*, at a rent fairly computed before the improvement. Hence it appears, that such practice, in the hands of judicious farmers, is excellent: and Mr. Middleton observes, in the 12th volume of the same work, that it almost invariably secures a large, first crop of turnips; which (when fed upon land well stored with ashes) are the best preparation for subsequent crops; and that there are very few (if any) cases, in which, with proper management, paring has not perfectly succeeded.

Parmesan-Cheese. See vol. i. p. 500.

PARK, a tract of ground inclosed, and privileged for the retention and propagation of animals of chase, either by the King's grant, or by prescription.

In order to constitute a park, it is necessary, 1. That there be a legal grant; 2. That it be inclosed with pales, a wall, or with a hedge; and, 3. That there be beasts of chase, such as bucks, does, &c.; because, if these be destroyed, the privilege becomes void.

The best inclosure for a park is doubtless a brick or stone wall; but, as the erection of either is attended with great expence, the same purpose may be effected by *paling*; which ought to be made of the soundest heart of oak, and firmly fixed in the ground, to prevent any animal of prey from penetrating. To render it more secure, it will farther be advisable to train a quickset hedge to a considerable height, which should be kept in perfect order: and, if any person be detected in the act of defacing or injuring walls, pales, or other fence belonging to a park, he is liable, by statute, to the same penalty as is inflicted for stealing and killing deer. Such offences, if committed on a private manor, are punishable as *felony*; but, if in one of the royal parks, they are made *capital*, without benefit of clergy.

PARROT, or *Psittacus*, L. a very numerous genus of birds, occasionally imported from the East and West-Indies: they are too familiarly known to require any description.

Parrots, in their natural state, build nests in the hollow parts of trees, and their whole deportment much resembles that of apes; they sneeze, clear the throat, yawn, sigh, and laugh, not unlike human beings; and, contrary to the custom of all other birds, they skip about by placing the whole foot or heel on the ground. These prattlers inhabit only the warmest climates; are of various sizes, from that of a sparrow to a hen; and often attain, even in captivity, the age of 100 years. They subsist chiefly on fruits and seeds; but, when tamed, do not refuse flesh, and even fish. —Their favourite food consists of sugar, nuts, and bread soaked in wine, to which they only prefer the seeds of the *carthamus*, or bastard-saffron: the latter are exceedingly grateful to their palate, though, when given to other animals, such seeds produce a purgative effect.—Parsley and its seeds are fatal poisons to this variegated bird.

In their native climates, parrots are very spirited creatures; but, when domesticated, they often become peevish, and lose their peculiar sprightliness. When confined in cages, they are subject to frequent fits of the epileptic kind, to which they at length fall victims; unless relieved by a warm and dry temperature, as well as the frequent enjoyment of fresh country-air; for the smoke and cold of winter in towns equally tend to shorten their lives.

PARSLEY, the COMMON, or *Apium Petroselinum*, L. is a native of Sardinia, whence it has been introduced into Britain. It is propagated by seed, which, according to MILLER, should be drilled (early in the spring, as it remains several weeks under ground) in the proportion of two bushels per acre; in rows about one foot asunder, and *hand-hoed*; though Mr. MILLS (in his *Practical Husbandry*, vol. iii.), is of opinion, that the plants will flourish better; grow to a larger size; and be in all respects more perfect, if the distance between the rows be sufficient to admit a hoe-plough. He adds, that a smaller quantity of seed will be required; the culture will thus be less expensive, and, he is confident, the plants will afford better food for cattle.

This vegetable is eaten with great avidity by sheep; as it not only renders their flesh more delicious, but is also believed to preserve them from the *rot*; instances having occurred, where sheep fed on parsley remained sound, while those in the vicinity of the farm were uniformly subject to that disease. Mr. MILLS, therefore, recommends these animals to be fed with it, twice in the week, for two or three hours at each time.—It may likewise be beneficially given to sheep affected with the *scab* or *red-water*; and is said to be very efficacious in recovering *surfeited* horses, or such as are subject to the *grease*.

Beside its utility for feeding cattle occasionally, parsley is cultivated to a considerable extent in gardens, for culinary purposes.—Its seeds possess an aromatic flavour, and are sometimes used as carminatives: the root is of a sweetish taste; being slightly pungent and aromatic; it is principally employed in diet drinks; but, if taken too liberally, is apt to produce flatulency.

PARSLEY, the BASTARD STONE, or *Sison*, L. a genus of plants, consisting of eight species, four of which are natives of Britain. The principal of these is the *Amomum*, Common Bastard Stone-Parsley, or Hedge Honewort; growing in moist woods and hedges; flowering in the month of June.—Its small, brown, striated, and oval seeds, possess a warm, aromatic flavour; being reputed to be aperient, diuretic and carminative, they were formerly used instead of the genuine Lesser Cardamom.

PARSLEY-PIERT, or *Aphanes arvensis*, L. a low, indigenous plant; growing in corn-fields, and in dry gravelly lands; flowering from the month of May till August.—It is eagerly relished by sheep, and may also be used as a salad-herb.—In its medicinal effects, it is strongly diuretic; and supposed to be an effectual solvent of the stone in the urinary bladder.

PARSNEP, or PARSNIP, *Pastinaca*, L. a genus of plants, comprising three species, of which only the *sativa*, or Common Wild Parsnip,

nip, is indigenous. It grows on the borders of ploughed fields, in calcareous land, and flowers in the month of June or July.—As no cattle will touch this weed, it ought to be carefully eradicated.

In a cultivated state, this plant is known under the name of the *Garden Parsnip*; which requires a rich deep loam, though it will also thrive in sandy soils: on the contrary, wet and stiff land is very unfavourable to its growth.

Parsnips are propagated by seed, which should be sown in the months of February or March; and likewise in autumn, immediately after the seed is ripe; as otherwise the young plants will be over-run with weeds. If the seed be broad-cast, the plants must be thinned to the distance of 10 inches, or one foot, asunder: in case it be drilled, the rows ought to be 18 inches apart; the roots being also left at the distance of 10 inches from each other; horse-hoed twice; and earthed up after the second operation, but not so as to cover the leaves.—They are very hardy; and, if allowed to remain in the ground, are not injured by the severest frost.

Parsnips are of great value both for feeding cattle, and likewise for culinary purposes. They are reputed to be equal, if not superior, to carrots, for *pigs*, which eat them with avidity, and fatten speedily, while their flesh becomes much whiter. If washed clean, and sliced among bran, horses eagerly devour the parsnip-roots, and thrive well; nor are they easily heated, or liable to the disorders that often attack these useful animals, when fed with corn.

Parsnips fatten sheep and oxen in a very short time; and the assertion of the Jersey Society of Agriculture, that these roots "*will fatten a lean beast in three months*," has been verified by the experience of the Rev. Dr. De Salis, on whom the Society for the Encouragement of Arts, &c. in 1799, conferred their silver medal, for the cultivation of those excellent roots, for the above-stated purpose.—Hence they are particularly valuable as a winter food. The beef of cattle fattened on them, together with hay, is said to excel that produced from the best pastures alone:—the milk of cows thus fed, is not only richer, but yields butter of a fine saffron-colour, which is equal to that obtained from them, when feeding on the most luxuriant grasses.

If parsnips are to be housed, they ought to be taken up, when the leaves begin to decay; and these should be cut off three or four days before they are stored. It is not, however, advisable to dig them out early in the morning, before the dew is dissipated; as the leaves then contain a scalding fluid, and excite blisters, which continue troublesome for several days.

Considered as human food, parsnips are preferable to carrots; being exceedingly nourishing, and less flatulent than the latter. In the North of Ireland, the former are brewed with hops; and, when fermented with yeast, afford an agreeable beverage; they may also be preserved in sand for culinary use; and, if reduced to a *dry* state, by cutting them in oblong slices, which ought to be suspended on strings, either in a warm room, or the open air, such roots will remain sound for any period of time. Hence, they promise to be of considerable service on long voyages; for, by soaking them in warm water for the space of one hour, previously to the process of boiling, they will become as tender, and will taste equally sweet, as if they had been newly brought from the garden.—There is, however, a precaution which deserves to be stated; namely, that parsnips should never be dug up in the spring; because, when the roots at that season are growing upwards for producing seed, their juices acquire a poisonous quality; and instances have occurred, in which the internal use of them has been productive of fatal effects on the human constitution, such as furious madness: this remarkable phenomenon in vegetable nature, we relate on the authority of M. BECHSTEIN.

The seeds of parsnips are slightly aromatic, and contain an essential oil, which, according to Dr. WITHERING, "will often cure intermittent fevers."

PARSNEP, the WATER, or *Sium*, L. a genus of plants, comprehending sixteen species; four being natives of Britain; and the most remarkable of these are the following:

1. The *latifolium*, BROAD-LEAVED WATER PARSNIP, or SKIRRET, grows in rivers and fens, where it flowers in the months of July and August.—This herb is eaten by horses and hogs, but is disliked by sheep: the roots of this plant are very hurtful to man and cattle; and ought, therefore, to be carefully avoided.

2. The *angustifolium*, UPPER WATER-PARSNEP, or NARROW-LEAVED SKIRRET, thrives in ditches and rivulets, where it flowers from July to September.—This plant, as Dr. WITHERING observes, "certainly possesses active properties, which ought to be inquired into;" and BECHSTEIN remarks, that it is not less noxious in its effects than the preceding species.

3. The *nodiflorum*, CREEPING or PROCUMBENT WATER-PARSNIP, grows in rivulets and ditches; flowers in the months of July and August.—This plant is very serviceable in diseases of the skin. Dr. WITHERING cured a child six years old of an obstinate cutaneous affection, by administering three large spoonfuls of the juice, twice a day. He likewise gave three or four ounces to adults, every morning, in similar complaints, with the greatest advantage. Its juice is readily taken by children, when mixed with milk; and neither affects the head, the stomach, nor the bowels.

PARTRIDGE, or *Tetrao Perdix*, L. a well-known bird to the sportsmen of Britain. In shape, it resembles a quail, but is of more than double the size; its whole plumage is beautifully variegated, and it has a reddish spot on the breast.

Partridges chiefly inhabit cultivated fields, while the corn is growing; as it affords them a shelter, beneath which they breed. After the harvest, they resort to the upland meadows, where they lay from 10 to 20 eggs; and conceal themselves, together with their *coveys*, among the dead grass, in the hedges, amongst mole-hills, or beneath the roots of trees.

These birds are taken in various ways, but the most common is, by means of a setting-dog, and the gun. For this purpose, the sportsman should place himself at day-break with his dog, behind a bush, or at the foot of a tree, when the cock-partridge calls the hen; and, after flying to a small distance, repeats the call; then perhaps flying a second time. As soon as the sun rises, and the sportsman is able to take aim, he may *cast off* his dog, and pursue the object in view.—They are likewise taken with a net, and reared in places appropriated for their reception; but they cannot be tamed like the domestic poultry. Nevertheless, the inhabitants of Scio, an island in the Archipelago, rear large flocks of partridges, by treating them like geese and ducks, that visit the fields during the day, and return home in the evening: when the time of brooding approaches, the partridges abscond, but after hatching their coveys, the whole family returns to the farm-yard. Thus, we believe, this delicate fowl might likewise be propagated in the South of England, where the autumn is generally accompanied with mild weather.

Partridges are highly esteemed at the table, on account of their wholesome and tender flesh, which has an exquisite flavour.

Pasque-Flower. See vol. i. p. 48.

PASSION, a term employed to denote the actual degree of desire, or aversion, prevalent in the human mind, on realizing certain affections.

The passions may be divided into two classes; namely, those which are of an agreeable nature, and such as are calculated to produce a contrary effect. To the former chiefly belong hope, joy, desire, and love; to the latter, sorrow, envy, hatred, fear, terror, anger, &c.: on the nature of which, we occasionally treat in the progress of this work.

The influence of the passions on the human frame, is truly astonishing; sometimes they operate suddenly, at others slowly, and almost imperceptibly; but their effects are equally certain. Thus, sudden joy, and long continued sorrow, may become alike fatal; both terminating in death: the phlegmatic and indolent, however, are less subject to their sway than those who possess great sensibility, with an acute understanding.

All violent passions are of a dangerous tendency, and not unfrequently lay the foundation of incurable disorders. Hence those, who have any regard for their health, cannot exercise too strict dominion over their passions and affections: and, though the particular mode in which they act upon the human constitution, has not hitherto been determined, yet there doubtless subsists an intimate connexion between the mind and the body; for whatever injures the one, disorders the other.

The inquisitive reader, who wishes to derive information on this interesting subject, will peruse Dr. Cogan's truly *Philosophical Treatise on the Passions* (8vo. pp. 367, 8s. 6d. Cadell and Davies, 1800), in which amusement is blended with instruction.

PASTE, a composition of flour, mixed to a certain consistence with milk, water, or other fluids. It is used to form the crusts of pies, tarts, and similar articles of pastry.—Confectioners also employ it for a preparation of various fruits, that are baked and dried in a peculiar manner, which it would, in this place, be superfluous to detail; such as almond, apple, cherry, and currant pastes; as well as those of pears, lemons, plums, peaches, &c. As we are no advocates for such artificial compounds, we shall briefly observe, that the eating of immoderate quantities of pastry, and confectionary, is always attended with pernicious effects on the organs of assimilation, especially in children: hence the almost incredible mortality among these innocent victims, *in towns*, may be easily accounted for; because parents are often so obstinately blind to their own interest, as well as the welfare of their offspring, that nothing less than direful experience will convince them of their error. Thus, glandular obstructions of the mesentery, indigestion, scrophula, and other affections, are induced, which gradually undermine the constitution of the child; and, after a succession of colds or catarrhs, occasion a state of *atrophy*, which sooner or latter terminates a lingering existence.—See MESENTERY.

PASTE, likewise denotes a preparation of wheaten flour, boiled up and incorporated with water, till it acquire a viscid consistence. It is used in various trades, as a substitute for *size*, or glue, in pasting or cementing papers, books, &c. If the composition be intended for paper-hangings, or for other purposes where a considerable degree of adhesion is required, one fourth, fifth, or sixth part in weight, of pulverized resin is added; and, if the paste is to be still more tenacious, gum-arabic, or any kind of size, may be dissolved in the liquid, while the mixture is boiling.—As this viscous compound, unless it be preserved in a damp place, is apt to dry speedily, it has been recommended to dissolve a little sublimate of mercury (in the proportion of one dram to a quart), in the water employed: thus, it will not only retain its fluidity, but will also be secured from the depredations of rats, mice, and other vermin.

There are, however, various and less expensive vegetable substances, that may be aptly substituted for *flour*; a valuable article, of which considerable quantities are annually consumed for *paste*:—on this and similar occasions, we request the reader to consult the *General Index of Reference*, subjoined to the last volume of this work.

PASTE-BOARD, a kind of thick paper, which is usually formed by pasting several single sheets, one upon another. The principal use of such boards is for binding books, making letter-cases, &c.—Under the head of PAPER, we have taken an opportunity of introducing the most proper vegetable materials for manufacturing that useful commodity, as well as paste-boards.

PASTRY, a term denoting that branch of cookery, which is appropriated to the making of pies, tarts, &c. It is likewise, though erroneously, used to express the articles exposed to sale by confectioners.

All pastry is hard and indigestible without butter, or other animal fat: and, even with such addition, it is apt to produce the heart-burn, acidity, and complaints of indigestion. Hence, it would be an important discovery, if a method could be devised, of baking these compositions without the aid of yeast and fat; because the viscid, rancid matter of such ingredients, occasions obstructions in the abdomen, and is frequently productive of obstinate cutaneous affections.

Children, in particular, ought not to be indulged in the *habitual* eating of pastry; for their palates are thus artificially stimulated, and a false appetite is thereby created.

Hence arises that propensity which, in many infants, borders on gluttony; and which many weak parents consider as a criterion of perfect health. To the same fruitful source, we are inclined to attribute the sickly appearance of most children and childish adults in the metropolis; and refer the unprejudiced reader to the article PASTE.

PASTURAGE, or PASTURE, signifies either the business of feeding tame animals, or such land as is expressly reserved for the grazing of cattle.

Pasture ground is, at present, often preferred to corn-land, on account of the comparatively less labour which it requires; and, because it is erroneously believed, that the manure dropped by the cattle enriches the soil, and thus renders it more profitable, when laid down for grain.—Such land is divided into two classes: 1. *Meadows*, which are frequently overflowed; and, 2. *Uplands*, that are considerably more elevated, and consequently dry. The former produce a larger crop of hay than the latter, and do not require to be manured so frequently; but the hay is generally inferior to that obtained from the uplands. The flesh of animals fattened on the latter, is much finer and more delicate than that of such as are fed in rich meadows; the luxuriant herbage of which, remarkably promotes the growth of cattle. On the other hand, *dry pastures* are preferable to meadows; as they afford food during the winter, and are not so apt to *poach* on the return of spring: nor are they so liable to be over-run with weeds; advantages which amply compensate for the smaller crops of hay.

Having already pointed out the profitable nature of MEADOW-land, or that where IRRIGATION is practicable, under those respective heads, we shall proceed to state the most eligible methods of improving upland pasture.

The first measure to be adopted for this purpose is, the division of the land into fields, each comprising four, five, or more acres; to fence the whole with good hedges; and to plant timber-trees at proper distances, in order to shelter the grass from the boisterous vernal winds. The inclosure, however, ought not to be too small, particularly when the hedge-rows are to be planted with trees: for, if these be placed too closely together, they will render the grass *sour*, and thus materially injure the pasture.

All weeds, infesting the ground, must be carefully eradicated towards the end of summer, previously to their seed-vessels being formed: when sufficiently dry, they ought to be burnt, and their ashes spread on the land before the commencement of the autumnal rains; after which, the surface of the soil should be levelled, and sown with grass-seed that will vegetate in the succeeding spring.—Where the surface of the ground is of a cold, clayey nature, it may be improved by PARING and BURNING; but, if it be hot and sandy, it will be necessary to apply considerable quantities of chalk, clay, marle, or lime. Every mole-hill should likewise be pared, burnt, and the ashes immediately scattered over the land; though it will be advisable to sow the bare spots with grass-seeds, shortly before the rains of autumn.

The next operation is that of levelling the surface with a heavy wooden roller, in the month of February or March, during moist weather; in consequence of which, the grass will vegetate more luxuriantly, and the growth of weeds will be counteracted.

In laying down land for *pasture*, the greatest attention is requisite in the selection of seeds: the best for this purpose are, the finest upland hay-seeds, and the White or Dutch Clover. If the former be sifted from all extraneous substances, three bushels will be fully sufficient for an acre of land: of the latter, eight pounds will be necessary, which ought to be sown after the hay-seeds; because the clover, being considerably heavier than these, will otherwise sink to the bottom; and its distribution in the ground will be irregular.

When the first grass appears, all weeds must be speedily eradicated; as they will otherwise impede its growth; and, if suffered to stand till they shed their seed, the land will be so completely overrun, that the herbage will be totally suppressed.

Various methods are practised with a view to enrich pastures, and to promote the growth of the grass. Among these, *rolling* the ground two or three times, at proper intervals, during the spring, has been found very beneficial; for it compresses the grass, which thus acquires a thicker *bottom*: and the clover striking roots from every branch in contact with the ground, they will be matted so closely together, as to form a beautiful thick sward, that will cover the whole surface of the land, and flourish during the severest droughts.—Some graziers turn a few sheep, and one or two colts, into each pasture; which practice is very successful; for the sheep eat down and destroy the rag-wort (*Senecio Jacobæa*, L.), which vitiates many of our best pastures, where oxen only are fed.

New pasture-land may be advantageously stocked with sheep; because those animals will partially check the luxuriance of the grass; in consequence of which the latter will unite, or *mat*, at the bottom; and thus produce a tender herbage for cattle.—Pastures may likewise be materially improved, by alternately mowing and feeding off the crops.

In the counties of Cardigan and York, an excellent practice prevails, which, if it were more generally known, would be the means of ameliorating poor or indifferent pasture-grounds. The farmers *put up* such lands as early as possible in the month of May, for the summer season; during which they pay no other attention, than to eradicate docks, to destroy thistles, &c. In this state, the ground remains till December, when all the stock is turned in, and every animal will be in excellent condition, without the aid of hay, straw, or oats; while the milk, or butter, in all respects becomes equal to that produced at any other period of the year. The grass is sweetened by the frost, and remains uninjured by the snow; but, while the latter covers the ground, it will be necessary to resort to dry food. In the spring, young shoots of grass will burst forth beneath the shelter of the old ones, and both are eaten with avidity. By this practice, land formerly infested with moss, in consequence of its having been overstocked and grazed *too bare*, will soon be covered with palatable herbage; and the moss disappear without the aid of the plough, or of any *surface-manure.*

For a comparative view of the advantages and disadvantages of *pasturing* and *soiling* cattle, the reader is referred to pp. 462—3, of our first volume.—See also GRASS, and MEADOW.

PATENTS, or LETTERS PATENT, are privileges obtained from the King under the Great Seal, in order to convey the title, property, and exclusive right to an invention, discovery, or peculiar establishment, &c.

Letters Patent are usually granted for the term of 14 years, upon condition that the patentee specify his invention or improvement, in such a manner that the public may receive the benefit of it, and may be at liberty to practise or employ such contrivance at the expiration of the exclusive privilege. If, however, it should be found or proved, that the patentee's claims are not supported by originality; or, that he has wilfully disguised his invention, by giving a confused and erroneous specification, the privilege becomes void; and any person is permitted to adopt and make use of it with impunity. Many patents, indeed, are believed to have been *surreptitiously* obtained by speculative persons; who, from sordid, lucrative motives, swear themselves to be the inventors of things which they have read in foreign books, such as are not in general circulation. These unprincipled adventurers ought to be rigorously examined, whether they have any, and what pretensions to an art or manufacture, of which they profess to be adepts. Thus, it would be easily discovered, that they are plagiarists, and impostors, who evade the provisions made by law, by couching their specifications in terms and phrases, which they themselves frequently do not understand.

PATTENS, are a contrivance serving as a substitute for wooden shoes: they are furnished with an iron ring, and worn by women during wet weather, to protect the feet from moisture.

As pattens formed upon the common construction are liable to break, in consequence of which frequent accidents happen, various expedients have been devised by those who manufacture these articles, with a view to prevent such misfortunes. The following patent only has come to our knowledge: it was granted in 1798, to Mr. JETHRO HORNBLOWER, of Whitehall, in the county of Cornwall, engineer, for a method of making pattens (to be worn by women); by altering the composition and clumsiness of their shape; preventing them from breaking; and removing the uneasiness they occasion to the feet.—Not having seen the specification of this contrivance, we cannot state the principle on which it is conducted.

PEA, or *Pisum*, L. a genus of leguminous plants, consisting of four species; of which the following are the principal:

1. The *maritimum*, or SEA-PEA, is a native of Britain; growing on the sea-coasts, and flowering in the month of July or August.—It is eaten by horses, cows, sheep, and goats.

2. The *sativum*, or COMMON PEA, which has long been cultivated in this country. There are two sorts of this species, known by the names of *Grey*, or *Hog-Pea*, and of the *Common*, or *Garden-Pea*. The latter is again divided into many

varieties, of which gardeners enumerate not less than thirty; but we shall only state the names of those which amply repay the labour and expence of cultivation; namely, the *Grey Hog-Pea*; the *Common White Boiling-Pea*; the *Charlton* (or, *forty-day) Hotspur*; the *Rounceval*, *Blue*, *Large Grey*, and *Speckled Pease*.

All these varieties delight in dry warm soils, though the blue pea will also succeed on poor land. They are raised from seed, which is sown from the middle of February to the middle of April, in the proportion of from three to five bushels per acre, broad-cast; but, if drilled, two bushels will be fully sufficient. When they are sown broad-cast, the ground is usually harrowed, to protect the seed from the depredations of birds; but the drilled pease are earthed up, and weeded twice; the first time, when they are about an inch above the ground; and secondly, when they attain the height of about four inches.

No sooner do pease arrive at maturity, than they are attacked and devoured by rooks, wood-pigeons, and other birds: hence, it will be necessary to watch them with care: and, after cutting, or *hacking* them, as it is provincially termed, they should be formed into small *wads*, or bundles, and exposed for some days, so that the straw may wither, and the fruit become dry.

Beside their utility for culinary purposes, pease, when *harvested dry*, and ground into meal, are uncommonly serviceable for fattening hogs; as no other grain agrees better with those animals. If the straw be forward in autumn, and has been housed without injury, it will be little inferior to ordinary hay, and afford a very useful article of fodder; on which every kind of cattle will thrive: and, though it be apt to occasion gripes in horses, if given to them before the month of January, yet such effects may be corrected, by allowing a few turnips, cabbages, or potatoes, either with, or after they have eaten the pea-straw.

A crop of pease is so far from exhausting the land, that it may be considered as an excellent and ameliorating manure. Thus, *grey-pease*, in particular, if sown towards the end of March, and ploughed in shortly before they flower, will prove a valuable dressing for wheat. Hence, likewise, if the *Charlton* or *forty-day Pea* be sown early in the same month, the crop may be cleared off the field towards the end of June, or early in July; so that it will become an excellent preparation for turnips. Should the harvest, however, be later, the *wads* ought to be laid in rows, and the intermediate spaces ploughed without delay; by which practice the soil will not only be cleared from weeds, but at the same time be materially improved; the surface being rendered more loose and friable in consequence of the putrefactive fermentation beneath the pease; which exclude the rays of the sun, and retain moisture. In this manner, the culture of pease is not only a source of profit, but also saves labour in tillage; the turnips being sown after a single ploughing, which cannot be effected by any other crop.

Such is the method in which pease are cultivated for general use; but, in order to obtain them at an early season, the gardeners in the vicinity of the metropolis, raise them on hot-beds. For this purpose, they sow the *Dwarf-Pea*, about the middle of October, in warm borders contiguous to walls or hedges: when the plants appear, they are gently *earthed up*, to protect them from frost. During the severer parts of the winter, they are covered with pease-haulm, straw, or other light shelter, and occasionally earthed as they advance in size. Towards the end of January, or early in February, they are removed to a hot-bed, and afterwards sparingly watered till the fruit begin to appear; being also screened with mats from the intense heat of the meridian sun.

† In order to obtain a regular supply for the table, the gardeners in a similar manner cultivate the *Charlton*, or forty-day pea, the *Golden Hot-spur*, or the *Masters* and *Reading Hot-spurs*, which afford crops in succession. The greatest care, however, is necessary, to clear them from weeds in the spring, and also from vermin, which will otherwise destroy the whole produce. Their most formidable enemies are slugs, which particularly infest wet soils, or such gardens as are over-run with weeds. These insects conceal themselves during the day in small cavities under ground, and come forth in the night, when they do extensive mischief. With a view to check such devastations, it will be advisable, first to clear the land around the plants, then to destroy their recesses, and next to scatter a little slaked lime over the ground, very early in the morning, when the vermin are in motion. By this simple expedient, they will be effectually exterminated, without any injury to the pease, provided the lime be not too thickly spread over the plants.

In common with all other leguminous fruits, pease possess a strong mucilage, with an earthy basis, and yield a very solid nourishment to persons of vigorous stomachs; but, as *pulse* of every description evolves a considerable portion of fixed air within the bowels, it is apt to excite flatulency and costiveness, if eaten too frequently, or in too large quantities. On the other hand, pease boiled in a fresh, or green state, are equally wholesome and agreeable; being less flatulent, and more easily digested, than after they have attained to maturity.—*Bread* formed and baked, of pease alone, is remarkably solid, heavy, and unwholesome. BECKMANN informs us, that such bread, while new, had an agreeable taste, but was productive of hoarseness and sore-throats.—Experience, however, has evinced, that three parts of rye-flour, and one of ground pease, afford a palatable and more nourishing bread, than that made of wheat or rye alone.

PEA, the HEATH, or PEASLING; *Orobus tuberosus*, L. an indigenous perennial plant, growing on moist heaths and in woody meadows; flowering in the months of April and May.

This hardy vegetable may be easily propagated, either by parting the roots, or sowing the seeds in autumn; and prospers in any common garden soil.—Its root has a sweet taste, similar to that of liquorice; is highly nutritious when boiled; and has, in times of scarcity, served as a substitute for bread.—It is likewise held in great esteem by the Highlanders of Scotland, who chew it like tobacco;

and assert, that it obviates the uneasy sensation of hunger. In the counties of Breadalbane and Ross, the inhabitants bruise and steep the roots of the heath-pea in water, from which they brew an agreeable, though intoxicating, liquor.—In medicine, they are employed to promote expectoration, and supposed to be very efficacious in pulmonary complaints.—The herb is relished by horses, cows, goats, and sheep.

PEA, the NARROW-LEAVED EVERLASTING, or VETCHLING, *Lathyrus sylvestris*, L. an indigenous perennial plant, growing in woods and hedges, chiefly in the south-western counties of England; and flowering in the months of July and August.—This winding herb is well-calculated for arbours: its red blossoms are beautifully veined, and eagerly visited by bees; though the plant itself is said to be noxious to sheep.

PEACH-TREE, or *Amygdalus Persica*, L. a well-known exotic fruit, originally brought by the Romans from Persia to Italy.

There are numerous varieties of this tree, cultivated on account of their delicious fruit; the principal of which having already been stated in the article ORCHARD, pp. 308, &c. of the present volume, we subjoin the following, in order to complete the catalogue of this valuable production.

1. The White Nutmeg; 2. The Red Nutmeg; 3. The Early Purple; 4. The Small Mignon; 5. The Yellow Alberge; 6. The Beautiful Chevreuse; 7. Smith's Early Newington; 8. The Montauban; 9. The Vineuse; 10. The Bourdine; 11. The Rosanna; 12. The Old Newington; 13. The Royal; 14. The Rambouillet; 15. The Portugal; 16. The late Admirable; 17. The Nivette; 18. Venus's Nipple; 19. The late Purple; 20. The Persique; 21. The Catharine; 22. The Royal Anne; and 23. Bloody Peach.

On the Continent, these trees, as well as NECTARINES, are propagated by planting the stones of the fruit in autumn, in beds of light, rich earth, where they remain for a whole year, being sheltered from the severity of winter. Next, they are removed into nurseries, where they grow for two or three years, till they are finally transplanted to the spot of their destination. In Britain, however, this practice seldom succeeds: the peaches are therefore propagated by inoculating them in the month of August (if *single-blossomed)*, into the *St. Julian*, *Magnum*, *Gage*, or other free growing plum-stocks; or (if *double-blossomed)*, into the Muscle-plum.

The stocks ought to be planted first in the nursery, when they do not exceed the size of a straw; and, in the course of one or two summers, they will be ready for the reception of the bud. The INOCULATION, which is to be performed in the usual manner, seldom fails, provided it be carefully managed.

The Peach-tree has hitherto been usually cultivated against walls, where it produces the finest fruit: the double-blossomed, however, is sometimes reared in ornamental plantations; and, when in full blossom, exhibits a beautiful appearance. But, as in our temperate climate, this delicate fruit does not ripen till a late season, Dr. ANDERSON has contrived a method of forwarding its maturation, so as to procure it for the table as long as possible; and which, he conceives, to be less expensive than the common mode pursued by gardeners.

On the north side of a hot-house, constructed according to his plan (see vol. ii. pp. 495-6), he directs a number of oblong boxes to be provided, extending *nine* (or if it be thought necessary, *twelve*) feet in length; and the width of which is nearly equal to that of one of the sash-frames. Each box is to be placed upon four wheels, which are made to move on two parallel planks, as a kind of railway; so that they may be pushed forward or drawn back at pleasure, to the proper distance. These chests are, farther, to be filled to a sufficient depth with mould, and a tree is to be planted in each; the stem of which should rise in an erect posture, till it reaches within a few inches of the horizontal glass-ceiling of the hot-house. The shoots are then to be bent forward at right angles; the twigs trained horizontally, and fastened to a slight wooden frame, containing an open *wire grate*, so as to keep each twig in its proper place; the fore-part of such frame being supported, when drawn out of the house, by means of two staves provided for that purpose; and, when in the building, by fastening them to the joists. In order to introduce the tree into the hot-house, a moveable shutter is to be furnished immediately under the horizontal glass; on opening which, the frame is admitted, and the box pushed forward on its wheels, while an assistant within supports the frame, till the tree is brought closely to the glass; and, after properly securing such frame, the shutter is to be applied, and all the crevices around the stem of the tree should be carefully closed with well-tempered lute.

Dr. ANDERSON observes, that though this process appear intricate in the detail, yet it "will be found in practice the easiest thing imaginable." The peach-tree being thus placed, at the proper season of the year, and occupying the upper part of the hot-house, will at all times be exposed to the whole influence of the sun, and thus receive the full benefit of warm, congenial air. By the united effects of light and heat, the ripening of the fruit will not only be accelerated, but its colour and flavour will be considerably improved.

The best peaches have a delicate thin rind, a mellow, juicy pulp, and a delicious flavour. They are highly esteemed at the table, as an article of the dessert: but, if preserved in wine, brandy, or sugar, they lose their good properties. In a ripe and fresh state, they are wholesome, and of considerable service in obstructions and bilious complaints; as they allay heat, mitigate thirst, and are slightly aperient. Their kernels are likewise a salubrious bitter, and are supposed to be detergent.

Lastly, the flowers of peaches emit an agreeable fragrant odour, and have a bitterish taste. If distilled in a water-bath, they yield a whitish liquor, about one-sixth part of their weight; and which communicates to a large quantity of other liquids, a flavour similar to that of the kernels themselves.—An infusion of half an ounce of the fresh-gathered flowers, or a dram of them when dried, in half a pint of boiling water, sweetened with a little sugar, is said to be an useful laxative, and vermifuge, for children

PEACOCK, the COMMON, or *Pavo cristatus*, L. a well-known bird, about the size of a common Turkey, and acquiring, about the third year of its age, exquisitely beautiful plumage.

This creature is originally a native of India. According to some writers, it attains the age of 25, though others assert that it lives 100 years. The female peacock deposits 5 or 6, and sometimes from 8 to 12 greyish-white eggs, which she conceals at a distance from her usual abode: the period of incubation, in general, extends from 27 to 30 days. When the young brood is produced, they should be fed with curd, chopped leeks, barley-meal, &c. well moistened; — grasshoppers and some other insects, are to these birds exceedingly grateful; but nettles and elder-flowers are fatal poisons. In about five or six months, they will feed like the old birds, on wheat or barley, or whatever they may collect in the circuit of their confinement.

Peacocks chuse the most elevated places for their roost, such as the tops of houses, high trees, &c. Their cry, previous to a change in the weather, is loud and disagreeable.—Though their flesh at a certain age is coarse and unfit for the table, yet a young pea-fowl affords tender food, and is, by epicures, considered a delicacy.

PEAR-TREE, or *Pyrus communis*, L. a valuable indigenous tree, growing in woods and hedges, in various parts of Britain; and flowering in the months of April and May.

The pear-tree delights in rich soils and gentle declivities; but will not thrive in moist situations. It resists the severest frosts; its wood is smooth, light, and compact; and is used in considerable quantities by turners, for making carpenter's or joiner's tools, and for picture-frames, which are stained black, in imitation of ebony. The leaves impart a yellow dye, and are sometimes employed to communicate a green colour to blue cloth:—they are eaten by horses, cows, sheep, and goats.

In a wild state, the fruit of the pear-tree has an austere and unpleasant taste; but, when cultivated, it is highly grateful; and skilful gardeners have obtained not less than 1500 varieties, by inoculating, inarching, engrafting, &c. the common wild stock, with scions of other fruit-bearing trees.—The most valuable of these, whether for the dessert, or for culinary purposes, we have already specified, under the article ORCHARD (pp. 301 and foll. of the present volume), and shall therefore confine our account to the best method of rearing them, and to a concise view of their properties.

All the varieties of this tree are hardy, and will succeed in any common garden-soil, provided it be open and dry. They are propagated by engrafting, and by budding, or inoculating either upon *free* stocks, that is, such as have been raised from seed, or upon quince-stocks: the latter, however, require a rich and moist soil. Sometimes the scions are engrafted on medlars, in order to render them dwarfs; and nursery-men have also ventured to *bud* them on white or hawthorns, when there has been a scarcity of original or free-stocks. But such practice ought to be adopted only in cases of real necessity; as it renders the fruit *stony*, and otherwise diminishes its value. The relative salubrity of pears depends not less on the state of ripeness, or immaturity, in which they are used, than on their different properties; some of them being hard, astringent, and difficult of digestion.—The more juicy ones, however, possess a saccharine fluid, which does not oppress the stomach: nevertheless, all the varieties are more flatulent than apples, plums, or the generality of fruit; and winter-pears are particularly liable to such inconvenience; as they are commonly eaten at a period of the year, when the stomach requires stimulating, rather than cooling, nourishment.

Independently of their utility for domestic or culinary purposes, pears (if managed in a similar manner with apples for making CYDER) afford a pleasant liquor, known under the name of *Perry*. The best fruits for this purpose are those of Bosbury and Bareland, in the county of Worcester, and the Squash-Pear, as it is termed, in Gloucestershire; to which may be added the varieties known under the names of the *John*, *Harpary*, *Drake*, *Lullum*, and *Horse Pears*. All these, being reared in hedges, are so extremely harsh and tart, that no person can eat them in a fresh state; and they are refused even by hogs.—Perry is subject to the same duties as cyder, which have been stated pp. 113-14, of our second volume.

PEARL, a hard, white, glossy, and roundish concretion, which is usually found in the shell of the East-Indian pearl-oyster; though it is also occasionally met with in the shell-fish of Europe.—About the middle of the last century, a very extensive fishery was carried on, in the rivers communicating with lakes in the northern parts of Scotland; whence London was supplied with a considerable number of pearls, that were little inferior to those of the East; but this source of wealth is at present exhausted.

Pearls are formed of the same matter as the inner shell of the fish in which they are found; and consist of several coats spread with the greatest regularity over each other, in a manner similar to those of an onion. The most esteemed and *true* form of pearls is, a complete sphere; though they are sometimes pear-shaped, and of a considerable size, according to which their value rises progressively; as they serve for ear-rings, and other ornaments. They ought to possess a pure white lustre, perfectly clear from spots or stains; and their surface should be smooth and glossy; having a beautiful natural polish, which no art can improve.—The finest pearls are imported from the East; and, like rubies, &c. may be brought to England from any place, and in any ships, free from all duty.

Artificial Pearls:—As the genuine pearls are sold at an extravagant price, ingenious men have contrived methods of imitating them so completely, that they can scarcely be distinguished from those collected in the East. The principal ingredient, employed for this purpose, remained a profound secret for many years; but it is now ascertained, that it consists of the fine silvery matter, which is found on the lower side of the scales of the blay, or bleak-fish (*Cyprinus alburnus*, L.). These scales are first removed; then washed repeatedly in pure water; and, after

the

the different liquors have subsided, the fluid part is carefully decanted; when a pearly matter, of an oily consistence, remains at the bottom; which is denominated by the French, *Essence d'orient*. A small portion of this matter is dropped in a hollow, blueish glass-bead, that is gently agitated, till the whole internal surface is completely lined; when the cavity is filled up with wax, in order to impart solidity and weight. Pearls thus manufactured, possess fewer blemishes than such as are natural or genuine, to which they are fully equal, in point of brilliancy.

PEARL-ASH, a kind of fixed alkaline salt, prepared in various parts of Europe, and also in America, by melting and extracting the salts from the ashes of burnt vegetables; and, after evaporating the moisture, and reducing them to dryness, by calcining such ashes for a considerable time in a furnace moderately heated.—See ALKALIES.

The best *pearl-ashes* are obtained from weeds, the ashes of which yield a larger proportion of salt than most kinds of wood. And it appears from the numerous experiments of Mr. KIRWAN, that, among weeds, the FUMITORY produces the greatest quantity of salt; and next to it, WORMWOOD; though he observes, that if we attend only to the proportion of salt in a given weight of ashes, those of wormwood contain the most.—The Trefoil-BUCKBEAN *(Menyanthes trifoliata*, L.) also produces a larger quantity of ashes, and salt, than fern,

Pure pearl-ashes should possess a very acrid, caustic taste, and be uniformly *white*; though such criterion is not always to be relied upon, as they are frequently adulterated with lime and salt; impositions, not easily discovered by the eye. In order to detect this fraud, let a small portion of the suspected pearl-ash be exposed to the air till it become soft, when it should be held over the fire in a shovel: if the alkali contain any common salt, the latter will crackle, and a slight explosion will take place, as soon as it becomes hot.

Pearl-ashes are very generally employed in the manufacture of glass; for they combine with earths in a proper degree of heat, and form a vitreous mass: they are also used for domestic purposes, in washing linen, &c.; and are subject to a duty of 2s. 5½d. per cwt. on importation: but, by the 24 Geo. II. c. 51, § 2, 3, both pearl, and pot-ashes, may be imported duty-free from the British colonies of America.

In 1791, a patent was granted to Mr. GEORGE GLENNY, for his method of obtaining a larger proportion of *pearl* and *pot-ashes* from those of wood, than that which is usually procured.—The patentee's process consists in calcining the common wood-ashes in a furnace; previously to which, a small quantity of lime is to be sifted among them, to prevent the mass from vitrefying; though, if the latter be continually stirred during the process of calcination, the addition of lime will be unnecessary. When the ashes are calcined into a fine powder, they may be treated in the usual manner; but he observes, that it will be better to boil them in large vessels, especially during frosty weather.

PEARLWORT, the PROCUMBENT, TRAILING PEARLWORT, or BREAK-STONE, *Sagina procumbens*, L. an indigenous perennial plant, growing on walls; in sandy and boggy situations; in garden-walks, and paved courts: it flowers from May to August.—This elegant herb is one of the smallest productions of the vegetable kingdom: its thread-like stem divides itself into many branches; the leaves are slender and minute; the blossoms greenish-white; and the whole plant scarcely exceeds two inches in height.

PEAT, a well-known inflammable fossil, which is used in various parts of the world as fuel. There are two species of this remarkble substance:

1. A *yellowish-brown peat*, found in Scotland, Holland, and Germany. It is composed, according to Mr. KIRWAN, of clay mixed with calcareous earth and pyrites, and sometimes contains a portion of common salt. When fresh, it is of a viscid consistence, but hardens by exposure to the air; and, after separating the calcareous and stony matters, it is cut while soft, into oblong pieces, and thus sold for fuel.

2. Another species of a *dark-brown* colour, is dug up near Newbury, in the county of Berks, and consists of the branches, twigs, leaves, and roots of trees, together with grass, straw, plants, and weeds; which, after having lain for a long time in water, are converted into a soft mass, that may be cut through with a sharp spade. It is also principally employed as a substitute for sea-coal, or wood.

Independently of its utility as *fuel*, the ashes of peat afford a valuable manure. Having already stated, in p. 126, of our first, and in p. 160, of the present volume, the soils, as well as the manner, in which they may be most beneficially employed, we shall only add a fact of great importance to the practical agriculturist.—Lord DUNDONALD, whose exertions for the public good we have had frequent occasion to mention, recommends *peat mixed with salts*, as a most excellent manure, but, where the latter are not easily to be procured, he advises the urine of every kind of cattle to be substituted. His Lordship farther suggests the propriety, and advantage, of incorporating *lime* with peat; and the patriotic THOMAS JOHNES, Esq. observes, that *four* parts of peat, and *one* of lime, make a very valuable compost. Such lime, however, ought to be carefully slaked before it is added; as it will otherwise occasion considerable trouble to re-mix the whole.—For an ingenious and practical method of cultivating *peat-mosses*, see the article MOSS-LAND.

PEBBLES, a genus of fossils, comprising 34 species, which are again divided into numerous varieties. They chiefly consist of siliceous earth or *flint*, being insoluble in water and acids, except the *fluoric*; while they are destitute of taste, and fusible only by means of alkaline salts, with which they form *glass*.

Pebbles, in general, are roundish stones, composed of crystalline matter that is debased by various earths of the same kind; in consequence of which they become clouded, veined, and otherwise variegated. They are usually found at a considerable depth beneath the surface of the earth; and, being intermixed with sands, their strata serve as a natural drain to carry off superfluous waters, and thus prevent the formation of bogs, morasses, &c.

An absurd opinion prevails in some parts of the country, that the *swallowing of pebbles* is conducive to health; and that such stones assist the stomach in digesting food. This practice probably originated from the example of birds picking up gravel; an expedient which they instinctively adopt, and without which their health becomes impaired. The stomach of man, however, is essentially different in its structure from that of the feathered tribe; hence such aids are altogether useless, nay hurtful to the comminution of food.—Although many persons may swallow even *large* pebbles for a series of years, with *impunity*; yet this unnatural practice can be productive of no real benefit; and, as there are cases on record, in which it has proved fatal, the most judicious course will be to avoid so hazardous an experiment.

PECTORALS, a term employed to express such medicines as are appropriated to the diseases of the chest and lungs. They are administered either with a view to allay an irritation prevailing in the organs of breathing; such are, liquorice, linseed-tea, mucilage of gum-arabic, &c. which may properly be called *demulcents*; or, in order to promote the *expectoration* of tough and viscid mucus; for instance, the roots of the rattle-snake, calaguala (vol. ii. p. 82), or similar drugs; the use of which, however, requires great precaution.—See EXPECTORANTS.

In obstinate coughs, which do not yield to the *pectoral* remedies commonly prescribed, we venture, from experience, to recommend the following mixture: Take tincture of squill, and balsam of Copaiba, of each half an ounce; and syrup of saffron, one ounce: let them be incorporated, and a tea-spoonful may be taken, according to circumstances, every hour or, oftener.

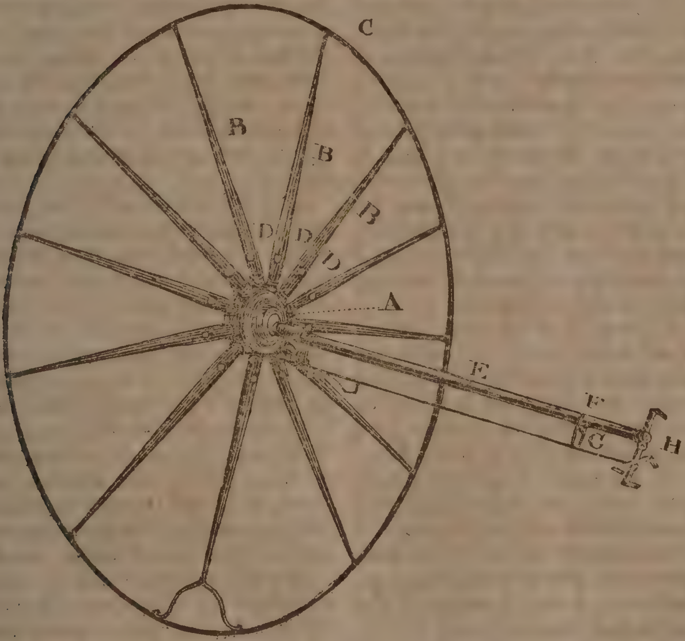
PEDOMETER, or PODOMETER, a contrivance for measuring distances, which is usually constructed in the form of a watch, and consists of several wheels with teeth, that are arranged in the same plane, and correspond with each other. Such instruments are either fastened by means of a string, chain, &c. to the knee of a person, or to the wheel of a carriage; and advance one notch at every step, or each revolution of the wheel: so that the number being marked on a dial-plate, the traveller is enabled to compute his progress by the number of his steps, or to measure accurately the distance between certain places. Some of these machines are contrived so as to mark both the time, and distance; by combining within the same case, the mechanism of a watch, so that they may be conveniently worn in the pocket.

The utility of pedometers for the purpose of *surveying land* being obvious, various instruments of this description have been constructed by ingenious mechanics, in order to facilitate the practice of geometry. Among these, Mr. EDGEWORTH's late contrivance deserves to be first mentioned, on account of its great simplicity; but, as it is calculated only for *level* grounds, and is apt to be deranged by hilly or irregular surfaces, we decline to enter into any detail.

A pedometer, upon a new plan, was a few years since contrived by Mr. W. FRASER, mathematical instrument-maker, of New Bond-street. It is stated to be perfectly correct, and not liable to be out of order,

order. The wheel-work is constructed on the scale of 1000 paces to a mile; and, as it winds itself up, while in motion, being adjusted to pockets of all sizes, it is attended with no trouble to the wearer. It is provided with a compass, by means of which the traveller is enabled to ascertain the different directions which he takes on his excursion; while he learns the accurate distance which he has walked. Hence it recommends itself to those invalids, who are obliged to take a certain degree of exercise within doors; as they may thus measure the thousandth part of a mile.

Another machine, which deserves more immediate attention, is the pedometer invented by Mr. Lewin Tugwell, of Beverstone, in the county of Gloucester, and which is represented in the following Cut:



A, The stock of the pedometer.

B, B, B, &c. Twelve spokes; one end of which is fastened by means of a screw to the outward ring, or periphery of the wheel, while the other is inserted in the stock.

C, The periphery, which is an iron ring $16\frac{1}{2}$ feet, or one pole in circumference; and which is divided into 25 equal parts, corresponding to the links of Gunter's chain for land-measuring, &c.

D, D, D, &c. Are twelve small

plates, representing the separate spokes, and each of which includes two links of the chain above-mentioned; the twelfth spoke being divided at its foot, for comprehending the 25th link.

E, An iron axis, being a screw with 320 circumvolutions, each of which is marked separately on an engraved index on one of its sides: and, in order to apply this part of the machine, it is screwed firmly into the stock of the wheel, with which it revolves when in motion.

F, A *style*, or *alidade*, being an expanding screw-nut, that embraces the axis, along which it screws, as the latter revolves with the wheel; and, as each revolution describes an exact longitudinal pole (four of which are computed to a chain), the style being pendent, and moving towards its proper figure, denotes the length of ground passed; as it is divided into chains and poles on the index of the axis E, and into links on the periphery C.

G, is a small adjusting screw; which being turned, the style may be removed to the beginning of the index, after the given line, in surveying or measuring land, has been ascertained in chains, poles, &c.

H, represents a cross, or square, with *sights*, for determining perpendiculars in land-measuring. It is suspended at its ends on the axis, whence it may be occasionally detached by a simple touch of the finger and thumb, when in use. Farther, this cross prevents the style from being revolved with the axis by any accident. As the 320 divisions marked on the index of the axis E, describe a mile, the style F, after having passed over them, will stop: and, as it will now move round with the axis, it will carry with it the standard; which will strike on the wrist of the operator, and thus prevent him from proceeding to any farther distance, till he withdraws his hand from between such standard and the axis. Having received this hint, he turns the screw G; puts the style F back to the bottom of the index, and continues the revolution of the machine, till he has completed his course.

Mr. Tugwell's contrivance is particularly calculated to prevent error in measuring land; as one person may thus survey with greater accuracy and expedition, than by the use of the chain alone. Besides, no fraud can possibly be committed by labourers, in measuring task-work; a circumstance of the utmost importance to agriculturists.

The last contrivance, we have been requested to mention, is that of Mr. Ralph Gout, of Bunhill-row, London; whose *new pedrometical patent-watch* differs from the instrument invented by Mr. Fraser, in this essential circumstance, that the former is connected with a time-piece, while the latter is combined with a compass. Those who live in the metropolis, or visit places, the situation of which is known to the traveller, will perhaps give the preference to Mr. Gout's capped metal watch with a pedometer, which he manufactures by subscription for 15l. 15s. (or the pedometer alone, for 8l. 8s.) :—on the other hand, we conceive, persons residing in the country, especially sportsmen, who are generally provided with a watch, on their excursions, will probably find Mr. Fraser's pedometer, on account of its *compass*, the more useful instrument.

PELLITORY-of-the-Wall,

the COMMON, *Parietaria officinalis*, L. an indigenous plant, growing on old walls, and among rubbish; flowering from May to September.

The leaves of this vegetable, when dry, exhibit a glassy appearance: and, if strewed on heaps of corn infested with weevils, are said to destroy these predatory insects.—In cases of *strangury* (see URINE), three ounces of the expressed juice of the plant, taken internally, or, a fomentation made of the leaves, applied to the parts, are said to be of service, on account of its cooling and diuretic properties.—Although chemists pretend to have extracted considerable quantities of *nitre* from the pellitory, yet we doubt whether this herb would answer the trouble of boiling it, and crystallizing the salt-petre; unless it were collected from such ground as is naturally impregnated with nitrous particles, which may more easily be obtained from the earth itself.

PELT-ROT, a disorder incident to sheep, in which the hair or wool falls off spontaneously.—It arises from various causes, but more especially in consequence of a sudden change from scanty or bad provender to full feeding; also from a local weakness in the skin, which parts with the wool; and, lastly, from the SCAB, loosening the hair at its roots.—This malady may be prevented by proper attention to the animals; by giving them wholesome food, and in regular proportions, particularly during the winter. Should it, however, originate from the scab, the removal of that distemper will also cure the pelt-rot.

PENCILS. See Black-Lead; p. 78, of the present volume.

PENNY-CRESS. See MITHRIDATE-MUSTARD.

PENNY-GRASS.—See YELLOW-RATTLE.

PENNYROYAL, or *Mentha Pulegium*, L. an indigenous plant, growing on moist heaths and pastures; flowering in the months of August and September.—This herb possesses properties similar to those of the mint; but it is more acrid, and less agreeable to the palate. It has long been esteemed as an aperient and deobstruent, particularly in hysteric and other female complaints. Hence, the distilled water is generally preferred; though an infusion of the leaves would answer the purpose, without giving an opportunity for tippling.—Dr. WITHERING observes, that the expressed juice of pennyroyal, with a little sugar, is an useful medicine in the hooping-cough.

PENNYWORT, the MARSH, or *Hydrocotyle vulgaris*, L. an indigenous perennial plant, growing in marshy or inundated grounds; and flowering in the months of May and June.—This herb is supposed to occasion the rot in sheep: it certainly contains an acrid, poisonous juice, which, according to BECHSTEIN, produces in the animals feeding on it, inflammations, bloody urine, and other mortal symptoms. Hence, every industrious farmer will endeavour to eradicate the pennywort from his meadows.

PEPPER, an aromatic berry, chiefly employed for culinary purposes.—There are three species of this spice at present in use, which are known under the names of black, white, and long pepper.

The first, or *black pepper*, is the fruit of the *Piper nigrum*, L. a native of the East Indies, where the berries are gathered in the month of October, and exposed to the sun for seven or eight days. They are at first green, but afterwards assume a red colour; and, on being divested of their external covering, they appear in the state in which the corns are used.

The *white pepper* is prepared by steeping the preceding sort in sea-water, and afterwards exposing it to the heat of the sun for several days, till the rind become loose. It is then taken out, half-dried, and rubbed till the husky shell separates; after which the white fruit is perfectly dried. By this process, the spice is deprived of a considerable portion of its heating property, and thus rendered more fit for various purposes, than the native black pepper.—There is, however, a kind of white pepper produced on a species of the *Piper*, that is far preferable to the factitious, and is little inferior to the black spice of that name.

Long pepper is said to be obtained from a third species of the same genus of trees: it is of a cylindrical form, about an inch and a half in length: its external surface appears to consist of several small grains, arranged in a spiral direction.

All the species of pepper possess a strongly aromatic smell, and a hot, pungent taste. The long sort, being the most powerful, is generally employed for medicinal purposes: the black is chiefly used in culinary preparations. On account of their heating and stimulating properties, however, the use of every sort requires some circumspection.

Pepper is an excellent spice, which should always be coarsely ground, and eaten only with fat, smoked, or tough animal food; with cabbages, cucumbers, and other flatulent and cold vegetables; and likewise with fish, and all substances that are difficult to be digested.—On the Continent, this spice is highly esteemed for its efficacy in relieving flatulency, weak or impaired digestion, and the giddiness which generally accompanies the complaint last mentioned. For this purpose, from six to ten grains are directed to be swallowed every morning, previously to taking food: such practice, however, ought to be adopted only in cases where the stomach is in a high degree vitiated; or the patient has been habituated to the free use of spices and spirituous liquors.

Pepper is permitted to be imported from the East Indies into London only; being also prohibited to be brought from Germany, and the Netherlands: it is subject to the sum of 2l. per cent. according to its value, on being deposited in the warehouses of the East-India Company; and also to the farther duty of 9½d. per lb. on being taken out for domestic consumption.

Pepper-mint. See Mint.

PEPPERWORT, Dittander Pepperwort, or Poor-man's-Pepper; *Lepidium latifolium*, L. an indigenous plant, growing in meadows and pastures, where it flowers in the months of June and July.—The whole plant possesses an extremely hot taste, not unlike pepper; and the leaves are frequently employed by the country people, as a substitute for that spice. —It is esteemed an acrid antiscorbutic; was formerly used instead of the *Horse-radish Scurvy-grass*; and may be easily propagated by its spreading roots.

PERCH, the Common, or *Perca fluvi-*

fluviatilis, L. is a well-known British fish, of a middling size, being covered with rough scales, and the back furnished with spiny fins. It frequents fresh water rivers and lakes, where it inhabits deep holes, and is exceedingly voracious.

Perches are very tenacious of life, and have occasionally survived a journey of 60 miles, in dry straw. —The smaller of these fish are said to be a very tempting bait for the *Pike*.

With respect to the angling for perch, there are two seasons of the year; the one commencing in February or March, and the other in July or August. Gloomy weather, attended with mizzling showers, and a strong southerly or westerly wind, generally promise success. Having selected the deepest and most turbid waters, the sportsman should repair to his stand about ten o'clock in the morning of the former season, and at sun-rise, during the latter.—Blood-worms, red-worms, and shrimps, either boiled or raw, are the most proper bait, particularly for the smaller perch. Should, however, these fish not bite freely, the bed of the water may be disturbed with a rake or pole; or it may be agitated by throwing in quantities of gravel, stones, or earth. They are, in general, bold creatures, and little pains are required to lure them to the bait.

The perch is a firm and delicate fish, being much esteemed at table.

PERFUME, generally speaking, denotes those volatile odours which arise from certain substances or liquids, and stimulate the organ of smelling; but this term more particularly alludes to the matter emitting such exhalations.

Perfumes are prepared of musk, as well as jasmines, tuberoses, and similar odoriferous flowers: they are also composed of lavender, marjoram, sage, or other aromatic herbs. These articles of refined luxury are chiefly employed by persons who conceive themselves not to be completely or fashionably *dressed*, without the liberal use of these drugs. Such custom, however, deserves severe animadversion; for, though the *occasional* use of perfumes may perhaps be justified by the laws of *fashion*, yet the daily practice of scenting the clothes, hands, face, &c. cannot fail to be productive of the most injurious effects to the constitution: thus, the nervous system is debilitated; the countenance is rendered pale and languid; and the whole train of distressing symptoms speedily follows.

PERRIWINKLE, the LESSER, or *Vinca minor*, L. an indigenous perennial plant, growing in woods and hedges, principally in the vicinity of Hampstead, and also in the environs of Manchester: it flowers in the month of May.—The leaves of this evergreen are smooth, glossy, and resemble those of the laurel: if suspended in a cask of wine recently filled, they not only clarify the liquor, but also improve its taste.—GLEDITSCH has successfully employed the whole plant, while in blossom, for tanning leather. In Germany, the country girls construct their garlands of these elegant leaves, during the winter.

PERRY. See PEAR-TREE, p. 357.

PERSPIRATION, in animal economy, signifies the exhalation of humours through the pores of the skin. It is either *sensible*, that is, *sweat*; or *insensible*, namely, such as cannot be perceived. In the latter sense, the term *perspiration* is generally understood when used alone; and in this signification we shall briefly consider the subject.

Insensible perspiration is the most important of the natural evacuations, by which all thin and acrid humours are carried off, and the body is cleared from impurities. This function is most active during the night; and it is computed, that healthy individuals perspire from three to four, or five pounds weight in the course of twenty-four hours. Hence the body feels more lively and vigorous when transpiration is uniformly effected; but, if it be obstructed, or become irregular from any cause or accident, the whole system will be disordered; so that head-achs, torpor in the limbs, and a variety of other complaints, are the consequence.

This salutary discharge, however, is very unequal in its operation, at different times. Thus, after a full meal, we perspire with less energy; but, when digestion is completed, both the circulation of the blood, and the action of the pores, receive additional vigour from the conversion of chyle into blood; so that perspiration is renewed with greater activity.

As numerous disorders originate from frequent irregularities in this most important function, the greatest caution is necessary to promote its activity. Hence all, who have any regard for their health, ought to fortify themselves against the sudden changes of our variable climate, especially by taking moderate exercise in the open air, every day; to avoid colds, or catarrhs, by guarding against wet clothes, or damp feet; as the moisture, when absorbed by the body, augments the danger arising from such imprudence. Persons thus situated, ought instantly to change their clothes, and not to sit or lie down, while they are wet; but, as many are prevented from availing themselves of this precaution, in such cases brisk exercise should be taken, till their dress become perfectly dry. In this manner, colics, inflammations of the bowels, rheumatisms, and a variety of disorders, both acute and chronic, may be effectually obviated: for no constitution however robust, can resist the hurtful effects arising from wet clothes.

Where perspiration is already obstructed, we would advise the patient to take moderate exercise; to bathe his feet in tepid water; and to employ mild sudorific remedies, when retiring to bed; such as a glass of cold water, if he be of a vigorous habit; or otherwise, a few cups of luke-warm tea; or white-wine whey, without spices; but never to indulge in the free use of spirituous mixtures. These, indeed, may prove a temporary stimulus to the body, and increase the circulation of the blood which had been impeded; yet, eventually, they will be productive of more injury than benefit; and thus imperceptibly induce the most detestable of habits.—See also Chronical Diseases, vol. i. p. 528.

PERUVIAN BALSAM, an esteemed drug, which is obtained from the *Myroxylon peruiferum*, L. a native of Peru.

This balsam is of the consistence of thin honey, and of a reddish-brown colour, inclining to black: it possesses an agreeable aromatic smell, and a hot pungent taste.—Being a warm medicine, which is more acrid and heating than the Balsam of Copaiba, it is used as an ingredient in various preparations,

tions, and chiefly for the cure of dysenteries, asthmas, and such disorders as arise from a debilitated state of the solids.—When incorporated with the yolk of an egg, or mixed with any of the syrups, the dose is from 10 to 20 drops.—Externally, it is employed for cleansing and healing wounds or ulcers, for mitigating painful bruises on tendinous parts, as likewise in paralytic and rheumatic complaints.

There are two other species of this drug, of a *white* and *red* colour, both of which are obtained by incision from the same tree with the common or black Balsam of Peru. They possess a greater degree of fragrance, resembling that of the Balsam of Gilead, but are very seldom imported.

PERUVIAN BARK, or JESUITS' BARK, a well-known medicine obtained from the *Cinchona*, a native of South America and the West Indies. Of this valuable tree, botanists have discovered ten species; but the following only deserve particular notice, viz.

1. The *officinalis*, or PERUVIAN BARK-TREE, which was introduced into Europe by the Jesuits.—It is of eminent use in fevers, especially in intermittents, which it seldom fails to remove, provided it be properly administered. The doses vary according to the age of the patient, the violence of the disorder, and other circumstances; but, in vernal agues, this drug is often unnecessarily swallowed.

Peruvian bark operates differently on various constitutions: sometimes it causes vomiting, in which case it will be advisable to take it in Port-wine, with a view to check nausea or retching. If it induce looseness, such effect may be counteracted by combining the bark with opium; and, should it oppress the stomach, this inconvenience may be remedied by the addition of some aromatic. Beside its use in febrile disorders, *bark* has frequently been found of service in the confluent small-pox, by promoting the eruption, and suppuration of the pustules, while it tends to abate the violence of the fever. Nor has it been found less useful, both internally and externally, in every species of gangrene, if employed in sufficient quantities. Farther, this drug has often been successfully administered in contagious dysenteries; in *passive* hemorrhages, for obviating the disposition to nervous or convulsive diseases; and, when combined with the vitriolic acid, it has been of essential service in the rickets, scrophula, ill-conditioned ulcers, and the first stage of pulmonary consumption: in the last mentioned cases, however, it will be advisable to adopt a milk-diet.—Peruvian bark pays, on importation, a duty of 9½d. per lb.

2. The *Caribœa v. Jamaicensis*, CARIBBEAN or JAMAICA BARK-TREE, grows to the height of fifty feet.—The bark obtained from the trunk abounds with fibres, and is more woody than that from the branches and roots: the latter, when dried, breaks more easily, and is pulverized with greater facility than the Peruvian. The Jamaica-bark is produced in the utmost perfection on the north side of that island, where it is highly esteemed, on account of its very agreeable bitter, answering every purpose of that imported from Peru: nor does the former occasion any oppression at the stomach, vomiting, or nausea, but checks such disagreeable sensations

tions in remitting fevers; and also in other cases where the stomach is disordered.

3. The *Triflora*, or Triple-flowered Bark-tree, is likewise a native of Jamaica, where it grows in the district of *Manchineel*, to the height of about thirty-five feet. Its bark is considerably thinner, and also more fibrous and red, than either of the preceding sorts; and, on being pulverized, assumes a deep cinnamon colour. It possesses a musty, bitter, and astringent taste, and has been given for the cure of fevers, in doses of 20 grains, to adults; but, as it occasions great nausea and sickness, it is seldom employed.

4. The *Floribunda*, or St. Lucia Bark-tree, produces a very thin, fibrous rind, which possesses an extremely nauseous bitter taste, and is remarkably astringent. When fresh, it proves a violent emetic; of which property it is not totally divested by age. This drug has cured both intermittent and remitting fevers, that had resisted the Peruvian bark: it is, however, seldom used, excepting in its native island; or in cases where the latter has either failed to afford relief, or cannot be easily procured.

5. The *Brachycarpa*, which was discovered about sixteen years since by Mr. Lindsay, an eminent surgeon and botanist, then of Westmoreland, in Jamaica. It seldom exceeds eight or ten feet in height; its bark is, externally, smooth and brown; internally, it resembles that of Peru in colour, but is more fibrous.—This species is less bitter, and more astringent than the common bark, and has been given by Mr. L. in doses of 25 or 30 grains, with the greatest success, in intermittent, as well as remitting fevers. He has also administered it, with advantage, in the forms of tincture and of decoction, in various cases of dyspepsy or indigestion. If, therefore, a sufficient supply of this drug could be obtained, it might prove an excellent substitute for the Peruvian bark.

Petroleum. See Bitumens.

Petti-gree, the Prickly. See Knee-holly.

Petty-muguet. See Cheese-rennet.

Petty-whin. See Rest-harrow, the Thorny.

PEWIT, or *Larus ridibundus*, L. a bird of passage, frequenting the British shores, the fens of Lincolnshire, Cambridgeshire, &c. but, after the breeding season, retiring to the sea-coasts.

Formerly, pewits were more esteemed than at present, and numbers were annually fattened to supply the table.—They construct their nests on the ground, of rushes, dead grass, &c.; in which the female deposits three greenish-brown eggs, marked with red-brown spots.—The young of these birds, called *red-legs*, are caught in the vicinity of the Thames, and much relished on account of their palatable flesh.

PEWTER, a compound metal employed in the manufacture of plates, dishes, spoons, and similar domestic utensils.

The basis of this metal ought to be *tin*, one cwt. of which being melted with 15lbs. of lead, and 6lbs. of brass, the whole forms what is called *pewter*. But there is another composition known by this name, and which consists of different proportions of tin, regulus of antimony, bismuth, and copper: these, after being incorporated into one mass, over the fire, are manufactured into vessels like those of common pewter.

From the dangerous properties of the ingredients employed for such domestic articles, great attention will be requisite, to keep them constantly in a clean state, and to suffer no acids or fermented liquors to remain in those utensils.—We are persuaded that many hidden and unaccountable causes of disease, especially of nervous and paralytic affections, arise from a quarter where they are least suspected. See also in the articles, CYDER, vol. ii. p. 114; and LEAD, vol. iii. p. 75.

PEWTER-WORT. See HORSE-TAIL, the Rough.

PHEASANT, or *Phasianus*, L. a genus of birds, comprising several species, of which the following are the principal; viz.

1. The *Gallus*. See COCK and HEN.

2. The *Colchicus*, or COMMON PHEASANT, originally a native of Asia, and thus denominated from the river *Phasis*, in Mingrelia: it is one of the most beautiful birds, on account of the vivid colour, and diversity of its plumage. In Britain, it inhabits woods, brakes, and thickets, in the day-time; and at night, roosts on the tops of the highest trees.

Wild pheasants construct their nests of dry grass and leaves, among bushes; and the female lays from twelve to twenty eggs in a season: the period of incubation extends to twenty-four days; but the young, being unable to provide themselves with food, would starve, if left solely to the protection of the hen.—For breeding pheasants, five hens may be allowed to a cock; these, if put together in a farm-yard, will soon acquire habits of familiarity with the common poultry.

Young pheasants are extremely difficult to be reared: their most proper food consists of ant's eggs, mixed with curds, or sweet oats and barley, which must be given them with great exactness, both as to the quantity and the time of their meals. The place in which they are confined, should be kept thoroughly clean; their water frequently changed; and the young birds not exposed to the dew of the morning, or allowed to ramble about, after sun-set.

When diseased, a repast of ant's eggs will, in general, speedily promote their recovery; but, if this remedy prove unsuccessful, wood-lice and earwigs, in equal proportions, seldom fail of restoring their health.

As an article of food, the flesh of pheasants is esteemed one of the greatest dainties; abounding with rich wholesome nutriment; especially when obtained in a wild state, and properly roasted with fresh butter.

PHEASANT's-EYE, the AUTUMNAL, CORN ADONIS, ADONIS FLOWER, RED MAITHES, or RED MOROCCO; *Adonis autumnalis*, L. an indigenous annual plant, growing in corn-fields, and flowering in the months of June and July.—It may be easily propagated from seeds, which ought to be sown in a light soil, in autumn, soon after they are ripe; as otherwise they seldom succeed. When the plants appear above ground, they should be carefully weeded, and occasionally watered in dry weather; but it will not be advisable to remove them till the autumn of the second year; when they may be transplanted to the place of their destination.—The beautiful scarlet blossoms of this plant greatly recommend its culture in gardens;

incalculable quantities of them being sold in the metropolis, under the name of *Red Morocco Flowers*.

PHOSPHORUS, a term generally given to such bodies as are luminous in the dark, without emitting heat or flame.

According to modern chemists, phosphorus is a simple, inflammable substance, which cannot be decomposed: when pure, it is transparent, and of a whitish colour; being slightly tenacious, and fusible in a degree of heat inferior to that of boiling water. It constitutes a part of all organized bodies, whether of the animal, vegetable, or mineral kingdom. Thus, if wood be decomposed by putrefaction, in a certain degree of heat and moisture, then broken into fragments, and exposed to the oxygen of the atmosphere, it will become luminous in dark places. Putrescent veal also shines under similar circumstances; and likewise the sea-weeds usually employed in packing oysters.

The existence of phosphorus in vegetables, was first ascertained by M. MARGRAAF, who observed, that farinaceous grains, when exposed in close vessels to an intense heat, in a peculiar degree possessed this property of emitting light. It has, farther, been discovered in sugar; gum-arabic; flour; dung; urine; bone-ashes; and in every other animal and vegetable substance; by the processes adopted in preparing the artificial phosphori of HOMBERG, KUNKEL, and other chemists.

Properties of Phosphorus:—Characters drawn on paper with solid phosphorus, will appear like a flame in the dark; though, in the light, a dense smoke only will be perceptible: and, if such paper be held near the fire, the letters will immediately become black, and continue to be as legible as those formed with ink. Great caution, however, ought to be observed in making such experiments; because, if a particle of phosphorus be rubbed between two papers, they will immediately take fire, which cannot be easily extinguished; hence it will be advisable to keep this inflammable matter continually immersed under water.

As phosphorus exists in all vegetables, Dr. DARWIN conjectures that it forms one of the articles of their food, and is absorbed entirely by their vessels, as often as it occurs in a state of solution; though it may also be occasionally formed, and secreted, by plants. In his opinion, it essentially contributes to their growth, and imparts firmness to timber-trees.—See PHOSPHORIC ACID.

In a medicinal view, phosphorus has a remarkable effect on the human frame; and, when administered with judgment and circumspection, forms a very powerful and valuable remedy. According to M. BARCHEWITZ, and other Continental writers, it has proved of essential service in paralytic, epileptic, melancholic, and maniacal attacks; in every species of eruptive fevers; particularly in those where the eruption *strikes in*, and is accompanied with anxiety, convulsions, and other nervous symptoms. He directs it to be given in doses of one grain, mixed with conserve of roses, or with any of the syrups.—Farther, a variety of cases have lately been published by M. LEROI, in France, who administered phosphorus internally with the greatest success, in consumptive diseases; in malignant fevers, where it effectually checked the progress of gangrene; and especially contributed

buted to the recovery of persons who had been reduced by intemperance. So potent a medicine, however, ought to be employed only with the utmost caution, and under the immediate superintendance of a competent judge.

Phosphoric Acid, is a peculiar acid, fixed in the fire, and composed of phosphorus, in combination with oxygen. It constitutes a material part of bone-ashes, from which it may be easily extracted by calcination, in the following manner: Take a large glass-jar, and dilute *one* pound of oil of vitriol with *twelve* pounds, or pints, of water; then add gradually, under constant agitation of the mixture, one pound and a half of finely pulverized ashes of bones, calcined to whiteness. During this process, an effervescence takes place, and a very pungent odour is disengaged. The vitriolic acid now forms gypsum, or sulphat of lime, by combining with the calcareous earth of the ashes; and the phosphoric acid, thus separated, unites with the water.—We have purposely inserted this experiment; as we have reason to believe that the *phosphoric acid*, when largely diluted (for instance, in the proportion of one or two drams of the acid to every gallon of water) will prove highly fertilizing to the vegetable mould employed by gardeners. And, though we cannot sufficiently corroborate such conjecture from our own experience, yet there appears to be ample ground to recommend farther trials to be made with this active and powerful agent. We have already remarked, that it exists throughout the vegetable kingdom, and is supposed (by one of our most profound inquirers into the arcana of Nature) to have a considerable share in the process of vegetation. It has also been discovered in the mineral kingdom; for instance, in the *apatite*, or phosphat of lime; and in the green *lead-spar* found at Zschopau, in Saxony.—This acid produces similar effects in the animal economy with the solid phosphorus; and, when used as an ingredient in lemonade, M. Leroi informs us, that it has proved of eminent service in the disorders above mentioned.

Phrenzy. See *Inflammation of the* Brain.

Phthisis. See Pulmonary *Consumption.*

Physic. See Medicine.

PHYSICIAN, an appellation given, in general, to those persons only, who exercise the medical profession, under the sanction of a diploma granted by an university, after a regular course of study. In a strict sense, every surgeon, or apothecary, who has received a liberal education, and practises the healing art on scientific principles, is fully entitled to the same distinction; though he have not obtained the degree which constitutes a *doctor of medicine.*—Consistently with this explanation, we shall venture to illustrate the official capacity of a physician, with a few occasional remarks.

When we consider the almost boundless acquisitions to be made in the different branches of natural knowledge, as well as in the practical acquaintance with that complicated machine, in which the human mind acts the most conspicuous part; when we reflect on the various requisites to *form* the character of a *true* physician, and the great trust reposed in him by all ranks of society—it will not appear surprizing to the cool observer, that, in this honourable profession, the number of its adepts should be equally diversified by their talents, their claims to public favour, and their modes of action.

It would be an invidious task, to attempt a classification of those numerous members of the medical profession, who are variously engaged in its different branches. We have already, under the articles APOTHECARY, and MIDWIFERY, briefly stated their respective qualifications; and, that we may not exceed the limits of our plan, we shall in this place confine our attention to the duties of a *physician.*—A man, who maintains this important station in society, ought, beside a competent share of knowledge, to possess a humane and sympathizing, though intrepid, disposition of mind: he must be candid on all occasions, without any studied reserve, but circumspect in his declaration to the patient; and, where danger is to be apprehended, nothing should deter him from concealing the probable termination of the case from parents, or the nearest relations. Nor will a physician of a liberal and enlightened mind, hesitate to explain the reasons, or causes, which induced him to prescribe certain medicines, in preference to others, perhaps differing from those of his predecessor. And, if he cannot, on the spur of the moment, determine himself respecting the most proper treatment, instead of prescribing conformably to the common routine of business, or copying a recipe from his memorandum-book, he will frankly inform the patient of the difficulty attending his complicated disease, and give the most appropriate directions for arranging every part of his diet and regimen. Thus, he cannot fail of acquiring confidence and credit; while he enjoys the pleasing satisfaction, that he has acted consistently with his conscience, and the dignity of his profession.

On the contrary, the *man of business,* when entering the sick-room, will previously direct his attention to the curtains, pictures, chairs, &c. instead of examining with the most scrutinizing attention the expressive countenance of the person, whose life perhaps depends on the *first* criterion, thus neglected. The truth of this remark must be obvious to every rational practitioner; though the result of it be not always of equal consequence. Having asked a few superficial questions (which are scrupulously repeated to every patient, and couched in the most concise phraseology, *in order to save time and trouble)* the man of business hastily feels the pulse; and, as it were by inspiration, writes a most elaborate and mysterious prescription, which is always obedient to *his* will:—a work of ten, or at the farthest fifteen, minutes! Its effects, however, are not so uniformly favourable to the expectations, and sanguine hopes of the patient:—nevertheless, after observing the operation of the medicines swallowed, in consequence of the second, third, or fourth visit, the disease acquires a name and character, not only corresponding to the symptoms *now* evident, but likewise to the definition given by the best nosologists. Thus, error is reconciled to error; and the daily reward is collected, while Nature exerts herself under this struggle of symptoms, till she at length makes a *critical* effort, either for the recovery or dissolution of the patient. Such is said to be the practice of those physicians, who degrade their profession into a *trade*; which is comparatively less respectable than that of the lowest mechanic!

Having hazarded these observations on the usual *routine* of a modern, or fashionable, physician (including both graduated and ungraduated, as well as associated and permitted, members of the different Colleges), we deem it our duty to point out those circumstances, and conditions, which deserve minute attention in the *first examination of a patient*.

In order to obtain a clear and complete view of *chronical diseases*, for which a physician is generally consulted, after the apothecary, together with the old matrons, have exhausted their stock of medicinal remedies, it will be requisite to proceed *more systematically*, and to inquire into the following particulars: 1. Duration of the disease. 2. Age and sex of the patient. 3. His external form and constitution of body. 4. His usual occupations, trade, or rank in life. 5. Whether married or single. 6. Climate; native country; and local situation with respect to dwelling. 7. Domestic circumstances and employment, if connected with the disorder. 8. Disposition of mind; character; mode of thinking; if influenced by political or religious views. 9. Extent of his mental capacity, or cultivation of mind. 10. Favourite pursuits. 11. Usual intercourse, or society. 12. Particular habits or customs. 13. Mode of living, with respect to food and drink. 14. Local or external affections. 15. The peculiar temperament.

When these preliminary inquiries have been cautiously instituted, without intruding on the patient; or appearing too officious to his affable relations; the systematic practitioner will next endeavour to ascertain the following data, leading to a more intimate knowledge of the disease: 1. The countenance of the patient. 2. His situation and posture in bed, or gait in the room. 3. His previous state of health. 4. The remedies and physicians he has employed on former occasions. 5. Idiosyncrasy, or peculiarity of constitution. 6. Instinctive propensities. 7. The prevailing character of diseases at the time, whether of an infectious, epidemic, or endemic nature.

Lastly, in order to discover the exact deviation from a natural or healthy state, none of the following points ought to be disregarded; though it should be impracticable to pay the most scrupulous attention to each, at the *first* interview: namely, 1. The internal and external sensations of the patient. 2. The commencement and progress of the disease. 3. Pulse. 4. Breathing. 5. Muscular energy. 6. The appearance of the head and hair. 7. The throat and neck. 8. Deglutition, or swallowing. 9. The chest. 10. The abdomen. 11. Appetite for eating or drinking. 12. The back or vertebrae. 13. The anus. 14. Vision, and the eyes, eye-lids, region about the eyes, and lachrymal glands. 15. The skin, with respect to its colour, and elasticity. 16. The nails. 17. The organ of smelling. 18. The prevalent taste in the mouth; appearance of the tongue and palate, together with the lips. 19. The organs of hearing. 20. State of the bowels, whether lax or costive. 21. Urine. 22. Insensible perspiration. 23. Expectoration. 24. Nausea, retching, or vomiting. 25. The circulation of the blood. 26. The organs peculiar to the sex, and their functions. 27. Periodical evacuations designed by Nature. 28. Sleep.

Beside these general points, which relate to every individual, an experienced inquirer will adapt his questions to the particular age, sex, and condition of the patient:—thus, children and young mothers; the nervous and hysteric; the hypochondriac and melancholic; each will suggest to his mind a different course for ascertaining the nature, seat, and origin of the disease. The result of this examination constitutes the difference between the empiric, and the rational physician: the former cures *symptoms*, not unlike the sagacious old woman who has studied HILL's and CULPEPPER's *Herbals*, or BUCHAN's *Domestic Medicine*, and similar *Family Physicians*; but the chief object of a medical philosopher, is the removal of *disease*, without neglecting the mitigation of painful symptoms; provided they originate from natural, not incidental causes; or, in other words, if they are connected with the state and progress of disordered functions.—Who, then, will pretend, or believe, that a task so important and complicated, can be accomplished during the usual short visit paid by a *fashionable physician*?

PICKLE, a kind of brine or liquor, which is generally prepared of salt and nitre, with the occasional addition of spices, or aromatic herbs, for the preservation and seasoning of flesh-meat.—*Pickle* also signifies vegetables preserved by the use of vinegar and aromatics.—See PICKLING, *of Vegetables*.

Under the articles BACON and BRINE, we have already stated the general requisites to a good pickle: we shall, therefore, only add a few particular directions relative to this subject.—It has been ascertained by experience, that the best proportion of salt and nitre to that of *beef*, is the following: Take 8 lbs. of common salt, previously dried in a warm room, and 1½ oz. of salt-petre, likewise in a dry and pulverized state, to every 112 lbs. of meat: let the salts be properly incorporated before they are applied. The beef should be perfectly fresh and cool; as otherwise it cannot be preserved for a considerable time: the cask or vessel ought to be clean, dry, and provided with a moveable lid or cover, so as to support a weight on its top. Much, however, depends on the exact proportion of the saline ingredients in the pickle; and the accuracy with which these compound salts are distributed between the different layers of the meat; for, if any cavities remain between the pieces, so that air can penetrate and circulate through the interstices, it will be impossible to keep such meat many weeks, in an eatable state.

A similar preparation may be used for *pork*, *mutton*, and *geese*; which last, however, should be divided at least into two equal parts. Thus, the farmers in Germany pickle the different kinds of meat above mentioned, together with their beef, in the same vessels; chiefly with a view to fill up the vacant places at the sides, and prevent the corruption of the latter.

PICKLING, *of Vegetables*, is one of the modern refinements of luxury, which, in point of health, deserves no commendation. It is effected by employing the strongest vinegar, together with the most heating spices. This compound is rendered still more efficacious by previously boiling the vinegar with cream of tartar, before the aromatics are added. In such state, most vegetable roots, plants, fruits, seeds, walnuts, &c. may indeed be preserved for any length of time, in order to stimulate the palate occasionally; and, as it is supposed, to promote the digestion of animal food: but, as the nourishing juices of vegetables are thus decomposed, and the fibrous or woody parts alone remain in the form of a sponge, we conceive such artificial preparations to be useless to a robust stomach, and detrimental to the digestive organs of invalids, or delicate constitutions. When used in very small portions, and only with fat and tough animal food or fish, pickles may serve as substitutes for salt, mustard, horse-radish, or pepper.—It deserves farther to be remarked, that all pickles should be kept in earthen, but *unglazed*, vessels; no copper or verdigrease must be employed; the air should be carefully excluded; and the room in which they stand ought neither to be damp nor warm.

PICTURE, a specimen, or piece of painting, in which particular persons, or subjects, are represented in colours, on wood, paper, canvas, &c.

Pictures form a valuable, though not a necessary, part of domestic furniture; and, as they are liable to become obscured by dust and smoke, or otherwise damaged, various expedients have been contrived to clean them. With this view, an ounce of tartar, and a similar quantity of glass-wort, may be boiled in a pint of water, till the liquor be reduced to one half, when it should be strained: while lukewarm, a sponge is to be dipped in the fluid, and rubbed over the picture; which must be washed immediately after with tepid water, and gently wiped till it become dry. A few whites of eggs are now to be beaten up, and applid with a feather to the painting, which will thus acquire a fine varnish.

As, however, the ingredients used by the painter often vary in different pictures, there can be no general rule given for removing superficial impurities; because the success of the experiment entirely depends on the application of proper substances; such as are capable of combining with dust, smoke, &c. without affecting either the varnish or colouring matter.—Hence, the safest process will be that in which the mildest means are employed: of this nature is the following expedient:—Let the picture be first taken out of the frame, then covered with a clean napkin, which should be moistened with pure water, and suffered to remain in that state for a fortnight or longer, according to circumstances. During this period, the cloth should be occasionally wetted, till it has loosened or softened all the adventitious particles on the surface. A small quantity of purified linseed-oil is now to be passed over the picture, which will thus, in most instances, resume its former lustre.

For cleaning very *old paintings*, it has been recommended to make a ley of rain-water and wood-ashes, or preferably with purified pearl-ashes; and to cleanse them carefully with this lixivium. Such applications, however, as well as those of soap-water, spirits of wine, turpentine, &c. require to be employed with great precaution; because they are apt to corrode the oil of the painting, and thus expose the colours to material injury from the slightest friction. Alkaline solutions, or spirituous liquors, therefore, should be used only for particular spots, that have resisted the action of simple water, the oil of olives, or fresh butter. If these substances were timely resorted to, they would, in general, restore the picture to its pristine beauty, without affecting the delicacy of its shades.

Pig. See Hog.

Pig-Nut. See Earth-Nut.

PIGEON, or *Columba*, L. a genus of birds, consisting of 70 species, of which the *œnas*, or Domestic Pigeon, is a native of Britain. It is in general of a blueish ash-colour, and weighs from twelve to sixteen ounces.

This bird, with all its numerous varieties of *tumblers*, *carriers*, *powts*, &c. is derived from one species, denominated the *stock-dove*. In a wild state, it breeds in the holes of rocks, and in hollow-trees; but is easily reclaimed, and induced to build in artificial cavities, assigned for its habitation, where it becomes completely domesticated.

Pigeons are uncommonly prolific: and, though the hens, or Doves, lay only two eggs for each brood, yet those reared about the house, and suffered to fly abroad in quest of food, breed eight times in the year; nay, the species termed *monthly pigeons*, produce young ones almost every month: hence, it has been computed, that from one pair of these birds, if properly managed, the astonishing number of 14,760 may be obtained in the course of four years. It is farther remarkable, that the eggs laid in the afternoon are generally addled; that the dove sits on her eggs from three o'clock in the afternoon till eight in the morning; that the male performs this office during the rest of the time; and that the term of incubation is from 17 to 20 days.—They attain an age of 12 years; though, after the fourth year, their fecundity begins to diminish. An open situation, and a free exposure to the sun's rays, equally contribute to their prosperity: while common salt and nitre ought to be frequently given them, in order to preserve their health.

Pigeons are esteemed as a delicacy at the table, especially when young, and properly fed:—their dung is an excellent manure for particular soils (see vol. ii. p. 198); beside which, these birds are of great service in farms where wheat is chiefly cultivated; because they devour the seeds of weeds, that would otherwise impede the growth of the corn.

PIGEON-HOUSE, or Dove-cote, a structure usually erected of wood, for the accommodation and rearing of pigeons.

Dove-cotes ought to be built of a moderate height, and spacious, so that the birds may find sufficient room to fly about them with ease; and, in case any external object should alarm them, that they may readily escape. In constructing the nests, it will be advisable to interweave wickers, in imitation of those formed by wild pigeons; as they will thus be more easily domesticated, and have no inducement to forsake their habitations.

Should any repairs become necessary in the cote, or in the nests, it will be proper to complete them before the middle of the day; because, if the pigeons be disturbed in the afternoon, they will not rest quietly during the night, and the greater part will perhaps sit *moping* on the ground, till the ensuing day: such unfavourable accidents, in the breeding season, will either occasion the destruction of many eggs in embryo; or, if there should be any nestlings, they will consequently be starved.

In Mr. Parkinson's *Experienced Farmer*, we meet with a remark made by a skilful pigeon-breeder, who cautioned him "against letting the first-flight fly to increase his stock," but advised him to take them without exception; because they will otherwise appear at the *Benting-season*, that is, between seed-time and harvest, when pigeons are very scarce, and many of the young birds would pine to death, from mere weakness.—Pigeons rise early; and, as they require to be supplied with food only during the benting season, it should not be carried to the cote later than three or four o'clock in the morning: for, if it be served long after that hour, they will hover restlessly about the house, and thus be prevented from taking their proper exercise. During the greater part of the year, they ought to provide their own food; as they will find abundance in the fields, from the commencement of harvest to the end of the sowing season: on the contrary, those which are constantly fed at home, will not be prolific.

The spring-flight generally appears in the month of April or May; when all the eggs, which have been laid too late, must be removed. And, as the weather becomes cold after the harvest, the parent bird should not be suffered to sit so late as to be injured; for, though the young ones be hatched, they will be weakly, and useless; a warm situation being most suitable to their nature.

The utmost cleanliness ought to prevail in pigeon-houses; hence the holes should be carefully examined, before the breeding-season arrives. If any of the young die during the summer, they will speedily become putrid, and emit a disagreeable stench, which is extremely injurious to the inhabitants of the dove-cote: thus, from the insupportable filth, and smell, they are often unwillingly compelled to quit the eggs laid for a second brood; so that the principal part of the season is lost. Farther, as pigeons are very liable to be infected with fleas, all the nests ought to be cleaned; and, if it be conveniently practicable, they should be *washed out*, and the dung, or other impurities removed, immediately after the first flight is hatched: this business, however, should, on all occasions, be performed at an early hour in the morning; and the remaining eggs must likewise be removed, so as to render the habitation perfectly clean for the harvest-flight.

Thus managed, pigeons will thrive and multiply to an uncommon degree; but, as they have a great antipathy to owls, which sometimes enter their habitations, such intruders must be immediately destroyed. Rats, cats, weasels, and squirrels, are likewise their *mortal* enemies, and will speedily depopulate a whole dove-cote. To prevent these depredations, it will be necessary to examine the different avenues to the pigeon-house, regularly once a week, or oftener, and with minute attention.—Among the most common diseases of these birds, are, a species of itch, and a pustular eruption resembling the small-pox; either of which may be cured by mixing small quantities of crude antimony, in powder, with pure water, for their daily drink, till the skin appear perfectly clear.—From Mr. PARKINSON's book before quoted, we learn, that a *pigeon-conjurer*, who, by fascinating means effected the return of his emigrant birds, together with a colony of strangers, employed *salt* and *asa-fœtida*, as the principal ingredients in his secret composition.

Those of our readers, who wish to acquire more extensive information, respecting the management of the domestic pigeon, will be amply gratified by the perusal of Mr. GIRTON's *Complete Pigeon-Fancier*, &c. a small work, of which several editions have lately been published.

PIGMENTS, are preparations in a solid form, chiefly employed by painters, for imitating particular colours, and imparting them to the surface of bodies.

Pigments are obtained from animal, vegetable, and mineral substances; the last, however, are the most durable.—In the progress of this work, we have pointed out various materials, that may with advantage be applied to the purposes of the painter, especially under the articles COLOUR-MAKING, and COLOURING-MATTER: it would, therefore, be superfluous to repeat, in this place, those multifarious articles which are described in their alphabetical order; as the reader will be furnished with a distinct and complete arrangement of such matters, at the conclusion of this Encyclopædia, in the *General Index of Reference.*

PIKE, or *Esox Lucius*, L. an exceedingly bold and voracious fish, inhabiting most of the lakes of Europe, and likewise the ditches in the vicinity of the Thames, as well as the shallow water of the fens in Lincolnshire. This fish sometimes grows to a prodigious size; measuring two yards in length; weighing from 25 to 40lb. and living to the age of 100 years.

Pikes indiscriminately feed on fish, devouring their own species, as well as frogs, aquatic rats, the carcasses of other animals, and even swallowing young ducks alive, from the element on which they swim; nay, occasionally contending with the otter for its prey.—They cast their spawn in March or April, according to the mildness of the weather; and, while in high season, are variegated with beautiful green, yellow, and red colours; but, when these tints change, the fish are of inferior quality.—There is a peculiar method of taking the pike, practised, both in Lincolnshire and the island of Ceylon, by means of a *crown-net*, which is formed of a semi-circular basket, open at both ends. The sportsman, being provided with a small fen-boat, frequently immerses the machine to the bottom of the water; then with a pole ascertains, by the striking of the fish, whether he has been successful: by this simple expedient, great numbers of them are taken. It is farther stated, that pikes are often haltered in a noose, and thus secured while asleep, in the ditches near the Thames.

The method of angling for pike, is similar to that pursued for PERCH (which see); but, in this case, the line should be very strong, with a large Kirby pike-hook, fastened with gimp, which is far preferable to wire. The hook may be baited with a middle-sized roach, or a dace, gudgeon, small carp, or tench.

From its voracious disposition, the pike is a destructive inhabitant of fish-ponds; though, while young, it may be usefully employed among large carps, in order to exterminate frogs, snakes, and small fish of inferior value.--BECHSTEIN observes, that the carp and tench are the only fish which are not persecuted by this *water-wolf*.

The River-pike affords an excellent dish, and is far preferable to those caught either in the lakes, or at sea. Its flesh is firm, though short; and, if properly dressed, resembles boiled veal, more than any other fish: it is in season during the winter, and may be eaten with safety, both by the invalid and robust; as, contrary to the nature of animals preying upon others, it is equally mild and nutritious.

PILCHARD, a fish, which greatly resembles the common herring; and though its body is somewhat shorter, yet it is considerably thicker; and contains a larger proportion of oil.

Pilchards are fish of passage, appearing towards the middle of July, in extensive shoals, on the coasts of Cornwall and Devonshire; whence they depart at the commencement of winter; a few only returning after Christmas. This fishery proves highly advantageous to the inhabitants engaged in it: for, independently of the numerous persons employed in manufacturing ropes, nets, &c. the offals of the captures are consumed by the poor, and the refuse affords an excellent manure.

On taking pilchards, they are first conveyed to a warehouse; where they are covered with bay-salt for three weeks or a month, to discharge the blood, &c. after which period, they are washed in sea-water, to remove all impurities; and, as soon as they are dry, the fish are pressed closely into barrels, to extract the oil, that drains through a hole made in the bottom of the cask. Thus treated, they become fit for use; and, when properly dressed, are preferable to herrings; as their flesh is of a better flavour, and has a milder taste.

PILCORN. See OAT, the Naked.

PILES, or HÆMORRHOIDS, are small round excrescences appearing on the verge of the anus, without any apparent swelling:—if attended with a discharge of blood, they are termed the *bleeding piles*; in the contrary case, *blind piles*.

This affection is generally accompanied with a sensation of weight, pain, or giddiness in the head; difficulty of breathing; nausea and sickness; pains in the back, loins, and anus.

The piles chiefly occur in persons, somewhat advanced in years, and disposed to corpulency; in the plethoric, and debilitated; in those who lead sedentary and luxurious lives, especially in men who are addicted to the free use of liquors. If the disorder be inherited, it usually appears at an early period of life: and sometimes during childhood, or even infancy. In the periodical bleeding piles of hysteric, hypochondriac, or gouty patients, no medical assistance will be requisite, so long as the flux continues moderate; for, in such case, it is a salutary effort of Nature.

The pre-disposing causes of the piles are, obstinate costiveness; voiding of hard feces; acrid purgatives, especially such as contain aloes; obstructions in the hæmorrhoidal vessels; the frequent use of highly-seasoned food, and of sweet wines; the indulgence in violent passions; and lastly, *sitting on damp ground.*

Hæmorrhoidal patients ought to attend to their habits of body, their strength, age, and mode of living; because such discharges as may prove hurtful to some, may be very beneficial to others. One ounce of rich conserve of roses, mixed with new milk, and taken three or four times in the day, has been found of considerable service, if continued for several weeks, or months, till its effects become evident. Peruvian bark has also proved useful, on account of its invigorating and astringent properties; but, where the piles have originated from obstinate diarrhœas, small doses of ipecacuanha, or other gentle emetics, have been administered with the greatest success.—If costiveness occasion this complaint, proper attention to that circumstance will be requisite; but, if the disorder originate from weakness, or want of tone in the *rectum* (see ABDOMEN), strong purgatives must be avoided; the part affected should be bathed twice a-day with a sponge dipped in cold water, and the bowels regulated by the mildest laxatives.

In the *blind* piles, blood-letting has occasionally been of essential service; though we are no advocates for *artificial* evacuations.—Emollient injections may be employed with advantage; but, where the diseased part is obstructed to such a degree as to render the application of clysters impracticable, gentle emetics have often been eminently useful. If the tubercles be very painful, and no discharge ensue, the patient should sit over the steam of warm water: and, in case no relief be thus obtained, leeches must be applied to the tumors themselves, or the adjacent parts: if, however, these insects do not adhere, it will often be necessary to employ the lancet.

Among the numerous remedies devised for the cure of this malady, none appears to be more efficacious in the most inveterate cases, than the internal use of *sulphur.* Persons of a costive habit may take of this mineral five grains, with half the quantity of rhubarb, two or three times every day, either in pills, or mixed with conserve of roses: which doses should, according to circumstances, be continued for several weeks, or longer. In plethoric constitutions, a few grains of nitre may be added to each dose; the propriety or safety of which, however, ought to be decided by professional advice.

Various external applications have been recommended for the piles; but, as they are either too stimulant and hazardous, or designed only to cool and keep the parts in a moist state, this object may be effected by means of emollient poultices.—Where the pain is extremely acute, the application of common or fresh linseed-oil, or of juniper-oil, has frequently mitigated the sufferings of the patient.

During the prevalence of this complaint, the diet should be cool and nutritious, consisting principally of milk, bread, vegetable jellies, broths, &c. Fermented and spirituous liquors will be hurtful: hence the patient ought to drink decoctions of the marsh-mallow roots, and other mucilaginous vegetables; orange whey, &c. He should, farther, studiously avoid the influence of the depressing passions, and whatever may tend to aggravate the disorder; especially riding on horse-back, and sleeping in feather-beds.—On his recovery, moderate and daily exercise in the open air will greatly contribute to invigorate the constitution; while his meals are temperate, and his conduct is adapted to the preservation of health, which otherwise will ever be in a precarious state.

PILEWORT, the COMMON, or LESSER CELANDINE, *Ranunculus Ficaria*, L. an indigenous perennial plant, growing in meadows and pastures; and flowering in the month of April.—This herb may be eaten in the spring, either boiled or in salads. Its root is uncommonly acrid, and blisters the skin; so that it may be employed as a vesicatory. Nevertheless, BRYANT, a French traveller, informs us, that, by skilful management, a tolerably good *starch* may be extracted from these roots.

PILL, a form of medicine resembling a small pea, and which is designed to be swallowed entire.

Drugs that operate in minute doses, and the offensive taste or smell of which requires to be concealed from the palate, are generally converted into pills. They dissolve with great difficulty in the stomach, and are calculated to produce very gradual and permanent effects. Hence, such medicines as are intended to operate speedily, for instance, *emetics*, ought not to be taken in pills; as these often pass through the stomach undissolved, and are decomposed in the intestines, where they prove violent purgatives. Nor should pills be adopted as a vehicle of medicines for children, whose tender organs of digestion are thus liable to be greatly injured.—We cannot approve of tampering with the stomachs of young people; and, of all the medicines prepared in the shops, *pills* are the most absurd, if not the most injurious to their constitution.

PILLS. See OAT, the Naked.

PIMENTO. See ALLSPICE.

PIMPERNELL, the BASTARD, or SMALL CHAFFWEED, *Centunculus minimus*, L. an indigenous low plant, which grows in salt-marshes and meadows near the sea-coast; flowers in the month of June, and seldom exceeds one inch in length.—For this useless weed, other vegetables thriving in *sandy* situations, ought to be substituted; in order to consolidate and improve the soil.

PIMPERNELL, the SCARLET, or *Anagallis arvensis*, L. an indigenous plant, growing in corn-fields and sandy places; flowering from May till August.—Dr. WITHERING observes, that every part of this plant is singularly beautiful: according to BECHSTEIN, it is much relished by sheep, and its flowers were formerly in great repute, for their supposed efficacy in curing the bite of a mad dog, as well as the giddiness in sheep.—It is farther remarkable, that these flowers regularly open between eight and nine o'clock in the morning, and close their petals at four in the afternoon.

PIN, a well-known little instrument, usually made of brass-wire, *blanched*, and which is chiefly employed by females, in adjusting their dress.

Notwithstanding the apparent simplicity of pins, their manufacture is extremely curious and complex; but, as a description of this article might be acceptable only to a few of our readers, we shall confine

fine our attention to the treatment which ought to be adopted, in case any pins should be inadvertently swallowed. Such accidents sometimes happen, to persons who imprudently accustom themselves to hold these dangerous utensils in their mouth, and even frequently retire to bed without removing them; an injudicious practice, that cannot be too severely reprimanded; for a sudden fit of coughing, or numerous other causes, may easily force the pin down the gullet.

As soon, therefore, as it can be ascertained that this pointed substance has been swallowed, it will be advisable to take considerable draughts of vinegar and oil of almonds; or, if the latter cannot be readily procured, any other sweet or salad oil may be substituted. Tartarized antimony, or tartar emetic, has, likewise, proved a very effectual remedy in such distressing situations: it ought to be given in doses of four or five grains, dissolved in warm water, which should be followed by the whites of six raw eggs, if the patient be an adult. These will coagulate in the stomach; excite vomiting; and thus occasion the ascending of the pin, together with the sheathing matter.—See also GULLET.

PINCHBECK, a factitious metal, the colour of which resembles that of gold; and which has received this appellation from its inventor.—It is produced by melting one part of *zinc* with five or six parts of *copper*; and it becomes more or less malleable, according to the purity of those metals. Some metallurgists, however, direct equal parts to be melted together; but Dr. LEWIS observes, from his own experiments, that pinchbeck bears a greater resemblance to gold, by employing zinc either in the largest or in the smallest proportion, than by using similar quantities of each ingredient.

Pinchbeck is manufactured principally into cases and chains for watches.

PINE-APPLE, the COMMON, or *Bromelia ananas*, L. is a native of Mexico and the Brazils, whence it has been introduced into Europe. It is propagated in Britain, by planting either the *crowns* or excrescences growing on the fruit, or the *suckers* produced from the sides of the plant (after they have been exposed in a warm place to dry for three or four days), in pots of light fresh mould, mixed with rotten dung; which has been prepared six or eight months, in order that its parts may be more completely united. They are now to be plunged in a hot-bed; and, if the season be warm, it will be advisable to water the plants, at least, twice in the week; though, in cool weather, one irrigation will be sufficient.

A practice prevails among some gardeners, of removing pine-apples to various pots: thus, however, the growth of the fruit is materially retarded; as the plants require to be placed in fresh pots only twice in one season, namely; first, towards the end of April in the second year, when the crowns and suckers of the preceding year must be transplanted into pots of a larger size; and, secondly, in the beginning of August; when such as are of a proper age for bearing fruit, ought to be removed into pots proportioned to their growth. With every change, the hot-bed should be stirred up, and fresh bark added, so as to raise it to the height at which it was originally formed; and, on re-placing the pots in such bed, the plants must be gently watered, in order to clear the dust, &c. from the leaves.—Thus managed, pine-apples will require little additional trouble, till the commencement of the winter; when the heat ought to be increased by artificial means of stoves or flues, and the plants to be watered gently every week, or oftener, if the mould should become dry.—Farther, no pine-apples should be removed into fresh pots, after the fruit appears; for such attempts would not only impede its growth and maturation, but likewise impair its delicate flavour.

The principal difficulty attending the propagation of this valuable exotic, in Britain, is the extirpation of the insects that infest it; and of which Mr. SPEECHLEY, in his practical "*Treatise on the Culture of the Pine-Apple*" (8vo. 1l. 1s. 1779), enumerates three species, viz. the *Brown Turtle Insect* (Coccus hesperidum, L.); the *White Scaly Insect*; and the *White Mealy-crimsoned Insect*. The expedients usually adopted for destroying such depredators, having failed of success, Mr. SPEECHLEY recommends the following preparation:—Take one pound of quicksilver, put it into a glazed vessel with one gallon of boiling water, and let it stand till it become cool, when the liquid must be decanted for use. This infusion must be repeated on the same quicksilver, till a sufficient number of gallons be provided. Next, six ounces of soft green soap are to be dissolved in each gallon; and the whole made lukewarm. The plants should now be taken out of the pots (the leaves of the larger ones being previously tied together), and immersed wholly in the liquid for three minutes; at the expiration of which time they must be exposed to the open air with their *roots* downwards, till they are dry. In the course of a few hours, the immersion should be performed a second time, previously adding one table-spoonful of sweet oil to each gallon of the mixture; after which the plants are again to be dried, with their *tops* inclining to the ground; and, as soon as the moisture is evaporated, they may be returned to the hot-house.—The proper seasons for taking these preventive measures, are stated to be the months of March and September.

In the 67th vol. of the *Philosophical Transactions* of the Royal Society, we meet with a curious and simple method of raising pine-apples *in water*, by WILLIAM BASTARD, Esq. The plant, contained in a pot of earth, is placed in a pan that is kept constantly full of water, and which is deposited on a shelf near the highest and most heated part of the back-wall of a hot-house; so that the pine-apples stand as closely as possible to the glass, without coming in contact with it.—The fruit thus raised, is said to be uniformly larger, and to possess a finer flavour than such as is propagated in the usual manner on bark-beds.

Pine-apples generally attain to maturity, in Britain, from the month of July till the end of September; but, when too frequently removed to different pots, or otherwise mismanaged, they will not ripen till the end of October, or November. Their maturation is known by the strong aromatic odour which they exhale, and by the facility with which the *crowns* or protuberances yield, on pressure with the hand.

As their flavour is speedily dissipated, by remaining on the plants longer than three or four days, they ought to be cut at the expiration of that time, and to be eaten within 24 hours, at the farthest.—This delicious fruit is reputed for its cordial and exhilarating properties: its acid juice, however, generally disagrees with females during gestation, as well as with persons who are subject to flatulency.—Among the different sorts raised in hot-houses, BECHSTEIN observes, the *white* and *red* pine-apples are the most esteemed: their juice, when fermented, yields a most agreeable and wholesome vinous liquor.

PINE-TREE, or *Pinus*, L. a genus of trees consisting of 30 species, of which the following are the most remarkable:

1. The *pineaster*, or WILD PINE, is a native of the mountainous parts of Italy, and the South of France, whence it has been introduced into Britain. It flourishes in very indifferent soils; attains a large size; and its branches are very extensive; but, as it advances in age, the leaves disappear, and the tree becomes naked and deformed: hence, it is seldom planted at present, though it was formerly in great esteem as an ornament to plantations. The cones of this species are remarkably large, containing a white, sweet, oily kernel; from one pound of which, five ounces of an excellent oil may obtained, by expression.

2. The *Sylvestris*, or *Scotch* FIR.—See vol. ii. p. 276.

3. The *pinea*, or STONE PINE, is a tall evergreen, growing naturally in Spain and Portugal. It delights in sandy loams; though, like the rest of the pine-family, it will thrive in any soil. The kernels produced by this species, are eaten in Italy, among other articles of the dessert, being preferred to almonds: they are reputed to be serviceable in colds, coughs, consumptions, &c.

4. The *Abies*, or *Spruce* FIR; and

5. The *picea*, or *Yew-leaved* FIR.—See vol. ii. p. 279.

6. The *Cembra*, or PINASTER.—See ARVENUSLY.

All the species of the pine are hardy trees; and, as they not only require a similar culture, but are also infested with the same vermin, the reader will find these subjects concisely stated, under the article FIR-TREE.

From this genus of trees is extracted the common turpentine, which, on distillation, affords the oil known under that name; the process is performed in the following manner: Early in the spring, the bark is pared off the pine-tree, in order that the sap may flow the more freely into the vessel placed for its reception. This is the common turpentine, which is fit for immediate use: after the sap has ceased to flow, the tree is cut into billets, which are thrown into a pit, where they are set on fire: during the ignition, a black, thick matter sinks to the bottom, whence it is conducted into a proper vessel. Such liquor is known by the name of TAR, which is poured into barrels for sale; but, if designed to be made into PITCH, it is boiled in large cauldrons, without the addition of water, or any other fluid; and, on becoming cool, it concretes into a hard black mass.

PINK, or *Dianthus*, L. a genus of plants consisting of 28 species, six of which are indigenous, viz.

1. The *Armeria*, or DEPTFORD

Pink, which grows in gravelly meadows, and flowers in July or August.

2. The *Barbatus*, or Sweet-William, which is common in gardens, and flowers in July.

3. The *Prolifer*, Proliferous Pink, Childing Pink, or Sweet-William; abounds in sandy meadows and pastures, where its flowers appear in July.

4. The *Caryophyllus*, Common Pink, or Carnation. See Clove-Pink.

5. The *Deltoides*, or Maiden Pink, grows in great abundance on sandy meadows, pastures and heaths, in various parts of Britain: it is in bloom from July to October.

6. The *Cæsius*, or Mountain Pink, thrives in dry mountainous situations, principally on the Chedder Rocks, in the County of Somerset. It is perennial, and flowers in the month of July or August.

All these species are beautiful plants, very generally cultivated in gardens, on account of their fragrance. They are propagated by seeds, as well as by slips, and layers; the latter of which should be planted three inches apart, towards the end of July, in shady borders that have previously been well dug and moistened. Should the weather prove dry, it will be necessary to water the slips, &c. daily, till they have taken root; after which no farther care will be required than to clear them from weeds, and to transplant them in autumn to those borders which they are designed to decorate.

Florists bestow uncommon pains on the culture of these elegant flowers, which they have divided into seven classes, and these again into varieties, of which there appear to be several hundred. The limits of our work, however, do not permit us to give a catalogue, even of those pinks which, for the uncommon beauty of their variegated shades, are the greatest ornaments of the garden. Hence we shall briefly state the most effectual methods lately discovered, of destroying the insects, and especially the *green aphis* or plant-louse, with which these flowers are peculiarly infested. One of the most simple expedients, is that suggested by a German florist, J. C. Wendland, and which has been uniformly successful. In the spring, when the grass has attained the height of 4 or 5 inches, he places his flower-pots, containing pinks or other delicate plants, attacked with the green aphis, in a lateral direction on the grass, so that one side of the former comes in contact with the tops of the latter. When no frost or rime is to be apprehended, this exposure is most effectual in the evening; though it should not be attempted with green-house plants which, in general, are less hardy than the pink. After lying in such situation for 24 hours, he turns his flower-pots toward the opposite side, in order that this likewise may be touched by the blades of the grass; and thus he inverts them for three or four successive days. If a frosty night should intervene, he defers to expose his flower-pots in the grass, till the succeeding morning, and removes them to the green-house in the evening. By this management, the insects disappear, mostly on the second exposure, or at the farthest, on the third; but the turning of the pots should, on no account, be neglected.

Another method of exterminating the plant-louse on pinks, consists in fumigating the stocks early in February with the smoke of tobacco, and repeating this process in the green-house every fortnight, till they are removed to the open air of the garden.—Sprinkling the young plants with a decoction of wormwood, has also been found a very efficacious remedy against those destructive vermin.—See also Insects;—Propagation; and Seed.

Pipperidge-bush. See Berberries.

Pismire. See Ant.

Pisasphaltum. See vol. ii. p. 328.

PISTACHIA-TREE, or *Pistacia terebinthus*, L. is a native of Arabia, Persia, and Syria; where it grows to the height of 25 or 30 feet, and is cultivated on account of its fruit; which is imported into Europe, under the name of *Pistachio Nuts*.

This tree being seldom propagated in Britain, on account of its delicate nature, and the great attention it requires, we shall only observe, that its fruit is of the size of pease; has an unctuous and pleasant taste, somewhat similar to that of almonds; and abounds, like these, with a sweet and palatable oil, which is obtained by expression.—Pistachio nuts are reputed to be wholesome and nutritive: hence, persons reduced by long illness, may eat them with advantage, in moderate quantities, provided such oily food should not disagree with their digestive organs.—These nuts pay, on importation, the sum of $3\frac{1}{2}$d. per lb.

Pistol. See Gun and Fire-arms.

Pit-coal. See Coal.

PITCH, an adhesive gummy-resinous substance, which is prepared by inspissating Tar, or the liquid drawn from Fir and Pine-trees.

Considerable quantities of *pitch* are manufactured in Britain; but, as they are inadequate to the demand for this article in the building of ships, &c. the deficiency is supplied by foreign markets. The best pitch is imported from Sweden and Norway: it is of a glossy black colour; perfectly dry; uncommonly brittle; and generally employed by ship-builders:—being less pungent and bitter than *tar*, it is frequently used in medicine, and chiefly in the preparation of warm adhesive plasters. In some cases, however, it excites blisters, though in general it only reddens the part to which it is applied, and from which consequently exudes a slight degree of moisture. On account of these stimulating properties, plasters of pitch are often useful in colds, coughs, rheumatisms, and similar complaints.

Pitch-plaster is prepared by melting together six ounces of white resin, seven ounces of ship-pitch, and five ounces of yellow wax; and afterwards forming them into a plaster.—See Scald-head.

Pitch pays on importation the sum of 13s. $7\frac{1}{2}$d. per last of 12 barrels (each containing $31\frac{1}{2}$ gallons), provided it be brought in *British ships*: but, in *foreign vessels*, it is subject to the duty of 14s. $4\frac{1}{2}$d. per last; or 12s. $1\frac{1}{2}$d. if imported from any of the British Plantations in America, or from any American State, in English ships.

PLAGUE, or *Pestis*, is one of the most fatal disorders that have often depopulated extensive regions of the earth: it is defined to be a very contagious, nervous fever,

ver, attended with extreme debility.

In the year 1665, nearly 100,000 persons died of this destructive malady, in the metropolis alone; and, as the commercial intercourse between this country and the Levant, renders the British ships and shores every year liable to contract this virulent contagion, which, if neglected on its first appearance, *might be* productive of dreadful consequences, we shall state the most striking indications of its presence, together with an account of the remedies that have been employed with the greatest success.—The first symptoms are, thirst, stupor, giddiness, and violent headach; a stiff and uneasy sensation, accompanied with redness and tumors about the eyes, which shed involuntary tears; the appearance of white pustules on the tongue; and, sooner or later, the eruption of carbuncles on the body; anxiety; palpitation of the heart, which, as well as the liver, becomes preternaturally enlarged; uncommon fetor of the breath; nausea; vomiting of bile; livid spots appear on the whole body; violent hæmorrhages; and, at length, a total prostration of strength.

Various causes have been assigned for the origin of this mortal scourge. Dr. CULLEN supposes it to arise from a specific contagion, which produces a general putrescency in the fluids, together with a sudden debility of the moving powers, or of the nervous system. Dr. RUSSEL also ascribes it to a pestilential contagion; but the following may be classed among the most obvious causes contributing to induce that disorder; namely, corrupt or damaged grain, putrid fish, or other animal substances; noxious exhalations arising from stagnant waters; residence in confined situations, where the current of air is obstructed; and, lastly, want of cleanliness.

The plague attacks persons of all ages and sexes indiscriminately, though some instances have occurred, in which certain countries and persons were exempt from its influence. Thus, we are informed by CHARDIN, HALLER, and other writers, that it is unknown in Persia, as well as in Japan. Nor are the gouty and dropsical subject to its attacks; and it appears from a variety of instances, that curriers are likewise exempt from its contagion.

The plague rages most violently in the summer, especially during the increase of the moon; its effects are somewhat diminished in autumn; and, during the winter, it is greatly reduced, or totally suppressed. No precaution, however, can secure any person from a second attack, as many have survived two, and even three visitations of this malignant disease.

Prevention.—Various means have been devised for this purpose; and, as the plague can be introduced into Britain only from other countries, the utmost circumspection is required in performing quarantine, and in ventilating the suspected merchandize, before it is suffered to be warehoused. But, if the plague should unfortunately break out in any particular family or place, those, who are obliged to have any intercourse with the latter, must carefully avoid to come in contact with the infected, or with any article that has passed through their hands. Such, however, as are induced to attend on the sick, ought to adopt the precautions already stated under the article INFECTION; to shun intemperance of every kind, and not to indulge in fear, or any of the depressing passions. Moderate exercise; frequent bathing in cold water; gentle purgatives; fumigations; the prudent use of wine and spirituous liquors; and, lastly, tonic and antiseptic medicines, especially the Peruvian bark, and camphor, have occasionally been found effectual preservatives.

Cure.—The remedies are as various as the causes producing the disorder. Bleeding, gentle laxatives, and mild emetics, have been employed with advantage, both in the earlier and advanced stages of the plague. Camphor, sudorifics, particularly opiates, when combined with small portions of neutral salts; the Peruvian bark, and acids, have all proved of great service.

Beside these general remedies, there are certain *specifics* which seem to deserve attention. In some observations lately published by M. GERSONIUS, a Swedish physician, on the plague that depopulated Tunis, we are informed, that the remedies he employed with the greatest success, were the flowers of the German Leopards-bane, and purified opium.—In the year 1771, a composition was published by the Medical Board at Moscow, and which was denominated the *Fumigating Powder*: it is said to have been of singular efficacy in preventing infection, and is prepared in the following manner.

Powder of the first strength:—Take six pounds of juniper-leaves, a similar quantity of juniper-berries, ears of wheat, guaiacum-wood, and sulphur; eight pounds of nitre, and two pounds of Smyrna tar, or myrrh: these ingredients are to be carefully incorporated, by pounding or bruising them in proper vessels.

Powder of the second strength:—Take five pounds of southernwood, and four pounds of the leaves of juniper, both cut into small pieces; four pounds of nitre, two pounds and a half of sulphur, and one pound and a half of Smyrna tar, or myrrh. Let these be duly mixed together, as above directed.

Odoriferous Powder:—Take three pounds of the root, called Sweet-Flag, cut into small pieces; one pound of frankincense; half a pound of storax coarsely pounded; half a pound of rose-flowers; one pound of yellow amber; and one pound and a half of common saltpetre, both pounded; one pound of Smyrna tar, or myrrh; and a quarter of a pound of sulphur. These articles should be properly mixed.

The Commissioners, who published these compositions, observe, that the cones of pines or firs may be substituted for the guaiacum, if the latter cannot be easily procured; the common tar may likewise be employed instead of that obtained from Smyrna, or of myrrh; and mugwort may be used in the room of wormwood.

The most successful remedy, however, that has hitherto been discovered for curing the plague, is *friction of the infected with warm olive-oil*, which we have incidentally mentioned in p. 286 of the present volume. It was first suggested by Mr. BALDWIN, late Consul General in Egypt, and then adopted by Father LUIGI DI PAVIA, who has exposed himself for nearly 30 years to infection, by his philanthropic and unceasing attendance on such as were attacked with this dreadful malady.

As soon as the first symptoms of infection are perceived, the person thus afflicted should be removed to a close room, and placed over the frame of a vessel containing hot coals; while his body is rubbed very briskly with a *clean* sponge dipped in *warm* olive-oil, in order to excite a profuse sweat. During this operation, it will be necessary to burn sugar and juniper-berries, as these will produce a thick smoke, and greatly promote the effect. Such friction, however, ought not to exceed three or four minutes; as it will, in general, be followed by copious perspiration; but, in the contrary case, the body must be wiped with a warm, dry, cloth; tepid drinks, such as elder-flower-tea, &c. should be administered to the patient; and the rubbing once every day continued, till the disease assume a favourable appearance.

In performing this simple operation, the greatest caution is requisite to guard against taking cold: such parts of the body, therefore, as are not immediately under friction, must be covered, and the linen remain unchanged, till the perspiration has entirely subsided.—It does not appear to be necessary, that the eyes should be touched; though the other tender parts of the body must be rubbed somewhat gently; and the whole process daily repeated till the patient evidently begin to recover. If tumors arise, they ought to be frequently, but softly, managed, till they become disposed to suppurate by means of emollient plasters.

Count BERCHTOLD (from whose pamphlet, published on this subject, at Vienna, in 1797, we have extracted the directions above stated), observes that the friction ought not to be delayed, till the mass of the blood, and the nerves, are affected; or till a diarrhœa ensue; as at so late a period, there will be little prospect of a cure: the patient, however, should not even in such case be neglected; for some have been recovered by the assiduous application of the means proposed; though the disease had already made great progress.

During the first four or five days, the patients must observe a very sparing diet; thus, the pious monk above mentioned allows them only a small quantity of vermicelli boiled in equal parts of vinegar and water, without the addition of any salt, or other spice. He likewise gave them, six or seven times in the course of the day, a small spoonful of sour cherries, *preserved in sugar*; and, when his patients were on the list of convalescents, he permitted them to take, on the fifth morning, a cup of good Mokha coffee, together with a piece of toasted biscuit, prepared with sugar; which quantity he doubled, according to their strength and improving state of health.

The proportion of oil to be employed at each friction cannot be ascertained with precision; but, in general, a pint or pound was sufficient: its salutary effects are not merely confined to the cure of persons infected with the plague; but it is likewise successfully used as a *preventive*. Hence Father LUIGI directs the attendants to rub themselves in a similar manner, previously to their attempting the unction of others; to avoid the current of the patient's breath; and *not to entertain the least apprehension of becoming infected.* Farther, they should adhere to a very abstemious diet; refraining from all food and liquors that may inflame the blood, and excite the passions.

On account of its extreme importance, we have discussed this subject at some length; for, if *olive-oil* be thus efficacious, both in curing and preventing the plague, it is highly probable that it may also be employed with the happiest effect, in other infectious disorders.

PLAISE, or *Pleuronectes platessa*, L. a well-known fish, caught in numbers on the British and Dutch coasts; sometimes weighing 15lbs.; though, in general, not exceeding eight or nine pounds.—The best and largest of these fish are taken off Rye, on the coast of Sussex.

Plaise differ from flounders, by their flat size; and having behind the left eye, a row of six tubercles. The upper part of the body and fins are of a clear brown, marked with large bright orange-coloured spots; and the belly is white. They cast their spawn in the beginning of February.

The flesh of plaise, while *fresh*, is equally tender, wholesome, and as easily digested as that of flounders; but, if the former be kept for several days, it is supposed to become purgative, and is consequently detrimental to health.

PLANE-TREE, or *Platanus*, L. a genus of trees, comprising two species, viz.

1. The *orientalis*, or Eastern Plane-tree, which is a native of Asia, and the Levant, where it attains a stupendous height, so that it is usefully employed in ship-building.

2. The *occidentalis*, or Western Plane-tree, which is indigenous in Virginia, and other parts of North America, where it grows to an uncommon size; instances having occurred, of trees measuring eight or nine yards in circumference; and which, when felled, produced twenty loads of wood.

Both these species are highly esteemed for their beautiful and majestic appearance: and, though their leaves decay early in autumn, they are industriously cultivated in their native countries, especially along public walks, and other places of resort, on account of their agreeable, cooling shade.—The plane-tree is very hardy, and will flourish in any common soil or exposure: it may be easily propagated by seed, cuttings, or layers, which should be committed to the ground in autumn. For this purpose, the soil ought to be somewhat moist, and in a shady situation; it should be formed into beds about four feet in width, which must be well dug and raked for the reception of the seed, cuttings, &c. These should be placed four inches apart: in the succeeding spring, the young plants will appear; and, at the end of one or two years, they may be removed into nurseries, where they are to remain, till of a sufficient size to be finally transplanted.

This deciduous tree, particularly the American species, grows rapidly, and is one of the greatest ornaments of modern plantations: its wood is excellent for various articles of domestic furniture, especially for tables; because, at a certain age, it abounds with veins, and when rubbed with oil, surpasses in beauty that obtained from the finest walnut-tree.—The dry leaves and branches of the Western Plane-tree, according to DAMBOURNEY's experiments, afforded a decoction of a very bright red-brown tint;

which, on adding different ingredients, either assumed various shades, or remained unaltered; so that they may with advantage be employed in dyeing.

PLANT, an organic fibrous body, consisting of roots and other parts: though capable neither of sensation, nor spontaneous motion, it attaches itself to other bodies, in such manner as to derive nourishment from them, and to propagate itself by seeds.

The constituent parts of plants are the roots, stems, branches, rind or bark, leaves, flowers, and seeds; which greatly vary, both in figure and size, according to the nature of particular trees, shrubs, &c.: as, however, the principle of vegetation is throughout analogous, we forbear to enter into a minute description of the various appearances, that have induced botanists to divide the vegetable kingdom into orders, classes, genera, species, and varieties.

All plants, however minute, are propagated by seed: and so easy is their cultivation, that in many instances they may be reared by parting their roots, or depositing layers, cuttings, &c. of the parent-stock, in such soils as are most congenial to their nature. Hence botanists consider them as an inferior class of animals; a conjecture, that is strongly corroborated by the regular circulation of the sap throughout all their parts; and by the *sleep* of plants, or the faculty which they possess of assuming, at night, a position different from that in which they appeared during the day.—This opinion, respecting the animal life of plants, has been carried to a still greater extent, by an eminent philosopher, whose name we have frequently cited, and who has minutely described the absorbent and umbilical vessels; the pulmonary and aortal arteries; as well as the veins, muscles, nerves, brain, and other parts relative to the physiology of vegetation.

Consistently with, and prior to the Linnæan classification, plants have been divided into *male*, that is, such as produce no fruit, possessing only the *farina*; and into *female*, or those which bear fruit, and also have the *pistil*, while they are destitute of the farina. And, as the fecundating dust is specifically heavier than the air, provident Nature has so arranged their organization, that in those plants, the pistils of which are larger than the stamina, the flowers are spontaneously nodding, in order that the farina may be more easily received. For a similar purpose, in aquatic plants, or such as naturally vegetate under water, the flowers emerge above the surface a short time before they blow. There are, however, many vegetables, in which the anthers or males bend into contact with the stigmas or females; and, as the former recede, others approach.—We could pursue this account of the *amatorial attachment* of plants to a greater extent, if it were compatible with the design of this work. — See also BOTANY; BULB; LEAVES; PLANTING; and TREE.

PLANT-LOUSE, PUCERON, or VINE-FRETTER, *Aphis*, L. a genus of insects, comprising many species and varieties, all of which are denominated from the plants they infest. Their rostra or beaks are inflected; they are provided with four erect wings; and the abdomen terminates in two horns, whence the juice, known under the name of HONEY-DEW, is said to be ejected

These insects are extremely prolific, depositing their eggs on the buds, leaves, and even the stems of plants; into which they thrust their minute beaks, and thus extract their sustenance.—As the vine-fretters are uncommonly numerous, these punctures, being continually repeated, disfigure the leaves, and otherwise materially injure the plant. Various means have therefore been contrived, with a view to prevent their depredations, and to extirpate these vermin.—Under the articles INSECTS, and PINK, we have already stated the most successful methods practised by gardeners for this purpose: hence, we shall only observe, that such insects appear to be generated chiefly by an improper management both of the soil and plants; namely, by employing crude manure, whether of animal or vegetable substances, not sufficiently putrified; by the use of stimulating liquids, such as bullock's blood, the water collected from farm-yards, and similar preparations; by the want of fresh air, or by excluding the young plants from the benefit of the dew, and the solar rays:—for it has been remarked, that vegetables, constantly exposed to the influence of the atmosphere, are not liable to be materially injured by plant-lice.

PLANTAIN, or *Plantago*, L. a genus of plants, comprising 39 species; the following of which are indigenous, and deserve attention.

1. The *major*, GREATER PLANTAIN, or WAY-BREAD, is perennial; grows on road-sides; and flowers from June till August.—According to Dr. WITHERING, the country people apply the bruised green leaves of this vegetable to slight wounds.—Cows and horses do not relish the plant, but it is eaten by sheep, goats, and swine.

2. The *lanceolata*, RIBWORT-PLAINTAIN, or RIB-GRASS, is also a perennial plant, very common in pastures, and flowers in the month of June.—LINNÆUS remarks, that this herb is eaten by horses, sheep, and goats, but wholly refused by cows; though the richness of the milk in the noted Alpine dairies, is, by HALLER, attributed to the nutriment derived from this plant, and the Common LADIES-MANTLE. —The former is often cultivated for pasturage, but does not answer the purpose, unless combined with clover or other grasses. The total absence of rib-grass, in marshy lands, is a certain criterion of their indifferent quality; and, in proportion as such soils are improved by draining, this plant will flourish and abound.—Dr. WITHERING observes, that when it grows detached from other grasses, for instance, by the sides of foot-paths, he has never known cattle to touch the Ribwort-Plantain; but that they certainly eat it, when mixed with other herbage.

3. The *Coronopus*, BUCKSHORN-PLANTAIN, STAR-OF-THE-EARTH, or HARTSHORN, grows on gravelly soils, near the sea-shore; and flowers from June till August.—There are two indigenous varieties of this species; namely, the Common Buckshorn, which abounds on heaths; and the Narrow-leaved Welch Plaintain, that flourishes on the mountains of that country.—Both afford wholesome food for horses; and BECHSTEIN informs us, that they have, in Germany, been used with great success for

curing the bite of a mad dog, as well as that of other raving animals.

PLANTAIN, the GREATER-WATER, or THRUMWORT, *Alisma Plantago*, L. a native perennial plant, growing in watery places, on the banks of pools and rivers; and flowering from July to August. —This acrid and poisonous vegetable is extremely deleterious to sheep and cattle: hence it ought to be carefully eradicated in the spring, or summer, before it can be farther propagated by its seeds.

PLANTATION, a term denoting, in general, a tract of land assigned to a planter, or person who engages to settle in a new colony. It also signifies a particular spot of ground planted with young trees, in order to form a wood or forest.

Plantations may be established on moors, and other indifferent soils, after the ground has been drained, or otherwise prepared for the reception of trees, in the usual manner. If the land be fertile, it should previously be ploughed; a small portion of lime scattered; and a brake-harrow passed over the soil, with a view to destroy the couch-grass: by this easy management, the ground will not only be completely cleared, but considerable trouble will thus be avoided for the future.—When the soil is reduced to a proper state, it may be planted with trees, that ought to be from four to six feet in height, and to be placed about eight or ten feet asunder, in such situations as may be most congenial to their respective nature. The ground should be hoed three or four times in the year; and, during the interval, those plants which stand too closely together, may be advantageously removed to other situations, where they are sheltered. This practice cannot fail of being attended with the greatest success: for the plantation will, in the course of seven years, produce sufficient foliage to shade the ground; and, as the dry couch-grass, or other weeds, will be prevented from causing any injury, the farther application of the hoe will become unnecessary.

Independently of the great value of plantations to posterity, they afford immediate advantages to their possessor. Where two or more trees interfere, and thus mutually obstruct their growth, the most thriving should be reserved, and the others felled for underwood; but, if such expedient should render the plantation too thin, it will be sufficient to *pollard*, or lop the tree of inferior quality; and, if it be a larch, or spruce-fir, to *trim* the part that impedes the growth of its neighbour. This operation, however, ought to be regularly performed at an *early* period, because there will otherwise be no underwood; nor will the principal trees acquire a substance proportioned to their height; and, if the *thinning* be delayed, they will be unable to resist high winds. Such trimmings may be advantageously employed during severe winters, in feeding cattle, that will eat the leaves, together with the twigs, or small branches: the refuse, or poles, when barked, may be cut into billets for fire-wood, or they may be converted into rails, for fencing.

ORNAMENTAL PLANTATIONS.

As there are many situations which may be easily provided with beautiful vegetable productions, without incurring great expence, we have subjoined a list of the most elegant shrubs, but chiefly of perennial herbaceous plants:—among the former, there are some that will thrive in the open air, only in the south of Britain; or, under certain precautions, also in the northern parts of the island; and these shrubs are distinguished by a small cross +.

1. *Shrubs.*

Amygdalus nana; or Dwarf Almond.

Azalea nudiflora; or Red American Upright Honeysuckle, a variety of the *coccinea* +.

Cistus ladaniferus; Labdanum Rock-rose +.

Colutea arborescens; Arborescent Bastard Sena.

Cytisus sessilifolius; Sitting-leaved Tree-trefoil.

Daphne cneorum; Spear-leaved Daphne, or Spurge Laurel.

Erica herbacea; Herbaceous Heath.

Genista triquetra; Three-cornered Broom, or Dyers Weed.

Hibiscus Syriacus; Syrian Mallow.

Kalmia angustifolia; Narrow-leaved Kalmia +.

——— *glauca*; Grey Kalmia +.

——— *hirsuta*; Shaggy or Hairy Kalmia +.

——— *latifolia*; Broad-leaved Kalmia +.

Ononis fruticosa; Shrub-like Rest-Harrow.

——— *rotundifolia*; Round-leaved Rest-Harrow.

Polygala chamaebuxus; Box-leaved Milkwort.

Robinia hispida; Rough False Acacia.

Rosa muscosa; Musk Rose.

Rubus odoratus; Scented Bramble.

Spartium junceum; Spanish Broom.

Viburnum Tinus; Common Laurustinus, or Viburnum +.

2. *Herbaceous, perennial plants, which flourish in the open air of this climate.*

(Bulbous roots are marked with *.)

Adonis vernalis; Perennial, or Vernal Pheasant's-Eye.

Agrostemma coronaria; Single-rose Campion.

Allium descendens; Declining Garlic.

Alyssum deltoideum; Trowel-shaped Madwort.

Alyssum saxatile; Rock Madwort.

——— *utriculatum*; Hollow Madwort.

Amaryllus lutea; Autumnal Narcissus, or Lily-asphodel.

Anemone hepatica; Liver-shaped Windflower.

——— *hortensis*; Garden Windflower.

——— *sylvestris*; Wood Windflower.

Anthericum liliastrum; Savory Spiderwort.

Antirrhinum alpinum; Alpine Snap-dragon.

——— *purpureum*; Purple Snap-dragon.

Apocynum androsaemifolium; Blood-leaved Dog's-bane.

Aquilegia Canadensis; Canada Columbine.

Arabis alpina; Alpine Bastard-Tower-Mustard.

Aster alpinus; Alpine Starwort.

Bellis perennis; Common Daisy, a variety of the *major*.

Bulbocodium vernum; Vernal Mountain Saffron *.

Campanula Carpatica; Carpathian Bell-flower.

——— *grandiflora*; Great Bell-flower.

Catananche coerulea; Purple Candia Lion's-foot.

Centaurea glastifolia; Woad-leaved Greater Centaury.

Clematis integrifolia; Siberian Virgin's Bower.

——— *viticella*; Blue Virgin's Bower.

Coreopsis verticillata; Whirled Tick-seeded Sun-flower.

Coronilla varia; Variegated Joint-podded Colutea.

Crocus vernus; Spring or Garden Crocus *.

Cyclamen coum; Coan Sow-bread.

Cynoglossum omphalodes; Creeping Hound's-tongue.

Cypripedium calceolus; Com-Ladies'-Slipper.

Dianthus barbatus; Sweet Wiliam.

——— *caryophyllus*; Clove Pink.

Dodecatheon Meadia; Virginian God's-flower.

Draba azoides; a species of the Whitlow-grass.

Dracocephalum Austriacum; Austrian Dragon's-head.

Epilobium angustissimum; Narrow Willow-herb.

Erinus alpinus; Alpine Cut-leaved Bell-flower.

Erythronium dens canis; Dog's-tooth Violet.

Fragaria chiloënsis; Chili Strawberry.

Fritillaria imperialis; Imperial Fritillary.

——— *meleagris*; Common Fritillary or Snake's-head.

——— *persica*; Persian Fritillary*.

Gentiana acaulis; Stem-less Gentian.

——— *asclepiades*; Swallow-wort Gentian.

Geranium pratense; Crowfoot-leaved Crane's-bill.

——— *pyrenaicum*; Pyrenean, or Mountain Crane's-bill.

——— *sanguineum*; Bloody Crane's-bill.

——— *striatum*; Streaked Crane's-bill.

Gladiolus communis; Common Corn-flag*.

Helianthus multiflorus; Many-flowered Great Sun-flower.

Helleborus hyemalis; Winter Hellebore.

——— *niger*; Black Hellebore, or Christmas-Rose.

Hemerocallis flava; Yellow Day Lily.

——— *fulva*; Reddish Day Lily.

Hyacinthus comosus; Hairy Hyacinth*.

——— *botryoides*; Clustered Hyacinth*.

——— *racemosus*; Branched Hyacinth*.

Hypericum calycinum; Large-flowered St. John's Wort.

Iris ochroleuca; Whitish Flower-de-luce*.

—— *Persica*; Persian Flower-de-luce*.

—— *pumila*; Dwarf Flower-de-luce*.

—— *sambucina*; Elder Flower-de-luce*.

—— *Susiana*; Hyacinth of Susa*.

—— *Sibirica*; Siberian Hyacinth*.

—— *spuria*; Spurious Hyacinth*.

—— *variegata*; Variegated Hyacinth*.

—— *versicolor*; Party-coloured Hyacinth*.

Ixia bulbocodium; Bulbous-headed Ixia*.

—— *chinensis*; Chinese Ixia*.

Lamium Orvala; Hungarian Dead-Nettle.

Lathyrus tuberosus; Tuberous Vetchling.

Leucojum vernum; Vernal, or Spring Great Snowdrop*.

Lilium bulbiferum; Bulbiferous Lily.

——— *candidum*; White Lily.

——— *chalcedonicum*; Chalcedonian Lily.

Linum flavum; Yellow Flax.

——— *virginianum*; Virginian Flax.

Lobelia cardinalis; Common Cardinal Flower.

——— *syphilitica*; Virginian Cardinal Flower.

Lupinus perennis; Perennial Lupine.

Lychnis chalcedonica; Chalcedonian, or Scarlet Campion.

Lysimachia ephemerum; Ephemeral Loose-strife.

Melissa grandiflora; Hetrurian Calamint, or Baum.

Mimulus ringens; Great Bastard Fox-glove.

Monarda fistulosa; Hollow Indian Horehound.

Narcissus Bulbocodium; Bulbous-Headed-Narcissus*.

Narcissus incomparabilis; Matchless Narcissus*.

——— *jonquilla*; Jonquil*.

Oenothera fruticosa; Shrub-like Tree-primrose.

——— *pumila*; Dwarf Tree-primrose.

Ornithogalum nutans; Nodding Star of Bethlehem*.

Papaver orientale; Eastern Poppy.

Phlox divaricata; Straddling Bastard Lychnis.

Potentilla grandiflora; Large-flowered Cinquefoil.

Primula acaulis, v. carnea; Stemless, or Fleshy Primrose.

——— *marginata*; Bordered Primrose.

Primula villosa; Woolly Primrose.

Prunella grandiflora; Large-flowered Self-heal.

Pulmonaria virginica; Virginian Lungwort.

Ranunculus acris; Buttercup.

——— *aconitifolium*; Wolf's-bane-leaved Crowfoot.

——— *gramineus*; Grassy Crowfoot.

Rubus arcticus; Arctic Bramble.

Rudbeckia purpurea; Purple American Sun-flower.

Sanguinaria Canadensis; Canada Bloodwort.

Saponaria Ocymoides; a species of the Soapwort.

Saxifraga crassifolia; Thick-leaved Saxifrage.

——— *mutata*; Variegated Saxifrage.

——— *sarmentosa*; Spreading Saxifrage.

Scilla amœna; Sweet Squill.

——— *campanula*; Bell-shaped Squill.

Sedum anacampseros; Decumbent Evergreen Italian Orpine.

——— *populifolium*; Poplar-leaved Orpine.

Sempervivum arachnoideum; Spider-shaped House-leek.

Soldanella alpina; Alpine Soldanella.

Spigelia marilandica; Indian Pink.

Tradescantia virginica; Virginian Spider-wort.

Trillium sessile; Sitting Trillium†.

Trollius Asiaticus; Asiatic Globe-Flower†.

Tussilago alpina; Alpine Colts-foot.

Verbascum Myconi; Mullein of Myconus.

Viola pedata; Bird's-foot Violet.

3. *Annual, or Biennial Flower-plants, or such as require to be frequently renovated by new seeds.*

Agrostemma Cœli rosa; Rosy Campion.

Alyssum halimifolium; Madwort, with whole spear-shaped leaves.

Anthyllis tetraphylla; Four-leaved Kidney Vetch, or Ladies'-finger.

Antirrhinum spartium; Broom Snap-dragon.

——— *triphyllum*; Three-leaved Snap-dragon.

Argemone Mexicana; Mexican Purging-Thistle.

Blitum virgatum; Rod-shaped Blite, or Strawberry-Spinach.

Briza maxima; Great Quaking Grass.

Campanula speculum; Bell-flower, with yellow, eye-bright leaves.

Cerinthe major; Greater Honey-wort.

Cheiranthus maritimus; Sea Stock-Gilly-flower, or Wall-flower.

Convolvulus Nil; Blue Bind-weed.

——— *purpureus, v. major*; Purple Bindweed.

——— *tricolor, v. minor*; Three-coloured Bindweed.

Crepis barbata; Bearded Bastard—Hawkweed.

Dianthus Chinensis; Chinese Pink.

——— *superbus*; Early Pink.

Fumaria glauca; Grey Fumitory.

Hibiscus Trionum; Venice Mallow, or Flower-of-an-Hour.

Iberis umbellata; Umbelled Candy-tuft.

Ipomaea coccinea; Scarlet Convolvulus, or Quamoilit.

Lathyrus articulatus; Jointed Chickling, or Pea.

——— *odoratus*; Scented Pea.

——— *sativus*; Common Chickling.

——— *tingitanus*; Tangier Pea.

Lavatera trimestris; a species of the Lavatera.

Lotus tetragonolobus; Winged Pea, or Bird's-foot Trefoil.

Lupinus luteus; Dusky Lupine.

Nigella damascena; Fennel-flower of Damascus.

Oenothera purpurea; Purple Tree-primrose.

——— *rosea*; Rose-like Tree-primrose.

Polygonum orientale; Eastern Knot-grass.

Reseda odorata; Sweet-scented Dyer's-weed.

Scabiosa atropurpurea; Brownish Scabious.

Scorzonera tingitana; Tangier Viper-grass.

Senecio elegans; Lofty Groundsel.

Silene pendula; Pendent Viscous—Campion.

Tagetes patusa; Spreading Marygold.

Trifolium incarnatum; Flesh-like Trefoil.

Tropaeolum majus; Greater Nasturtium.

——— *minus*; Lesser Nasturtium.

Zinnia multiflora; Many-flowered Zinnia.

Having communicated this extensive collection of plants, many of which are exotics, we shall briefly state the motives which induced us, in this instance, to deviate from our general plan: 1. All these shrubs and ornamental herbs may be easily procured from gardeners, and propagated in our climate. 2. They afford a pleasing variety of forms and colours. 3. Their flowers or blossoms will appear in succession, from the early spring to a late period in autumn; and, 4. There is no species here enumerated, that requires an artificial or troublesome mode of culture.

PLANTING, in gardening and agriculture, inplies the setting of a plant or tree; which, on being removed from its former place, is fixed in a fresh cavity proportioned to its size.

The best season for transplanting is, from November to the end of February; because the generality of plants, trees, shrubs, &c. during those months, are in a dormant state, and receive little injury from their removal; provided the weather be *open*. The quality of the soil, as well as the climate, situation, and exposure, should therefore be relatively consulted. It will also be necessary to mark the sides of the plants on which they are exposed to the sun, and to place them exactly in the same direction; for otherwise the circulation of the sap will be prevented, and their growth consequently impeded. Farther, the roots must be properly spread before the plant is settled in the ground, when a portion of fine mould should be strewed over them; and, on being sprinkled with water, the whole ought to be closely pressed down, to the consistence of unbroken earth.—A piece of long stable-dung, or a little sawdust, or the *shaws* of hemp or flax, should next be scattered on the spot, in order to prevent the roots from being injured by the frost; and, if the plants do not stand closely together, it will be advisable to support them with stakes, during the first year at the least: such stakes, however, must be carefully fixed in a triangular direction, inclining towards the tree at the top, in an angle of 30 or 40 degrees; and at such a depth, that they may not interfere with the roots. It will also be proper to insert a few *battens* between the posts, and to intertwine them with small birch, or other twigs, that will not damage the bark, while they admit a free passage to the rain-water: by this simple contrivance, the bark is at the same time effectually secured from the rot.

In the 4th volume of *Annals of Agriculture*, we meet with an interesting account of the cheapest mode of planting, which was accidentally discovered by James Barnard, Esq.—It consists simply in ploughing up new land, and sowing the seeds of the Scotch fir, together with oats. The crop of grain will, according to his computation, repay the expence of ploughing; and no farther trouble will be required. Thus, the most barren spots, though over-grown with furze, may be converted to the greatest profit; for, as the seeds of the latter continually vegetate in the soil, they will speedily grow up, and shelter the young firs, till they at length *over-top* the furze, which will eventually perish, while a stock of thriving plants will be obtained.

PLASHING of Hedges, a term employed by farmers to denote an operation, which is performed on quickset hedges at certain seasons, with a view to assist their growth, and promote their durability. For this purpose, the principal stems should be selected to serve as stakes, at proper distances, the tops of which are to be cut off at the height of four feet from the root; the straggling side-branches of the other part of the hedge must also be lopped, and several of the remaining shrubs separated closely from their roots; after which, the rest are transversely cut half way through, so that they may be bent to one side. These are next inflected in a position nearly horizontal, and interwoven with the upright stakes, in order to retain them in that situation. Farther, where hedges have been deformed with *gaps*, the divided quicksets ought to be laid very low at those particular spots, which should be supported by the addition of some dead stakes, or truncheons of willows. These wattlings will continue to vegetate, sending forth shoots from their stems; and, as the upright branches that arise from the stakes (the tops of which had been cut off) in a short time force themselves upwards through the hedge, they will unite the whole into an entire body, so as to constitute a strong, durable, and elegant fence.

The operation of *plashing* is sometimes performed in October, but more generally in the month of February or March; which latter season is the more eligible, because the divided plants will not be materially injured by the vernal frosts.

PLASTER, an external application of a more solid consistence than ointments, and which is usually spread on linen, leather, or tow, according to the nature of the wound or ulcer.

Plasters are prepared chiefly from unctuous matters, which are combined with powders, so as to retain their firmness when cold, without adhering to the fingers; though becoming soft and pliable in a low degree of heat, and acquiring sufficient tenacity from the warmth of the human body, to adhere to the part to which they are applied.

The consistence of these compounds varies, according to the different parts of the body, for which they are intended. Thus, if they be designed for the stomach or breast, it will be necessary to make them very soft and pliant: one ounce of expressed oil, with a similar quantity of yellow wax, and half an ounce of any suitable powder, will form a convenient plaster: But, if the preparation be required for the limbs, it ought to be made more firm and adhesive: hence, a double portion of wax, and an additional half ounce of powder, should be properly incorporated, and spread on leather, linen, or tow, in the usual manner.

London court-plaster: Dissolve the best isinglass (previously cut in small pieces) in any proof spirits, so as to obtain a strong viscid solution; then take taffety, or other thin silk, and spread the liquor uniformly over it, with a soft brush: when the first coat is perfectly dry, repeat this application a second and third time, till at length the whole surface should be sparingly anointed with Peruvian balsam.—Others prepare this noted plaster, by dissolving equal parts of storax in the cane; benzoin, the resin; and isinglass, in spirits of wine: these ingredients are to be digested in a glass retort, placed in a moderate heat for twenty-four hours; when the solution is filtered, and applied while lukewarm, in a manner similar to the preceding, but without any balsam.—See also WART and WOUND.

PLASTER OF PARIS, a preparation of several species of gypsum,

sum, which are obtained principally from Mont Martre, in the vicinity of that city.

The best plaster is hard, white, and somewhat resembles marble: it neither effervesces with aqua-fortis, nor emits sparks, when stricken against steel; but it is easily calcined in the fire; and, when pulverized, is of great use for casting statues, forming ceilings, &c.—It pays, on importation, the sum of 1s. 2½d. per cwt.—See ALABASTER and GYPSUM.

PLATE. See SILVER.

PLATINA, one of the most precious metals that was discovered in South America, about the middle of the eighteenth century. It is found chiefly in the river Pinto, and near Carthagena, in small, irregular grains, which are always combined with iron.

Platina retains its metallic lustre, in a manner similar to gold; nor does it become tarnished on exposure to the air: it is, however, extremely difficult of fusion, requiring an intense heat to reduce it to a fluid state. When properly refined, its colour is between that of iron and silver: it emits no smell; is reputed to be the most ponderous body hitherto known; and its specific gravity is, according to Mr. KIRWAN, to that of water, as 23 to 1.—Farther, platina is considerably harder than iron; and, remaining equally exempt from the effects of fire and air, it forms the best material for making crucibles. It resists the action of acids, sulphur, and alkalies; and, notwithstanding its uncommon hardness, is extremely ductile, so that it may be rolled into plates, or leaves, like those manufactured from gold; and Dr. WITHERING observed, that the wire of platina is much stronger than that of silver or gold of a similar thickness.

Lastly, platina possesses the property of soldering, or *welding*, without mixture, on which account it is preferable to gold. When formed into a mirror, the former metal reflects one image only, while it remains unchangeable like glass.

PLETHORA, or FULNESS, is that state of the human fluids, and particularly of the blood, in which they abound to such a degree, as to prove hurtful to the animal functions.

Young persons that lead an indolent or luxurious life, especially females; as well as those who have hastily suppressed any of the larger evacuations; or whose pursuits have been suddenly changed from an active to a sedentary employment, are particulerly subject to *plethora*;—which is likewise often induced by the indulgence in sleeping, longer than Nature seems to require. Hence the patient becomes languid, weak, and unable to take the necessary exercise for promoting the regular circulation of the blood; the pulse sinks, the action of the heart and arteries is speedily lessened; he becomes affected with violent palpitation, and oppressed with great vertigo, or dulness.

Such are the symptoms that generally prevail in this complaint; beside which, the vessels are frequently distended, and thrown into dangerous commotions. Thus, plethoric patients are peculiarly disposed to fevers, inflammations, hæmorrhages, and a long train of chronical and other diseases; of which they are not easily cured, on account of their singular dislike to avail themselves of proper exercise.

Although *plethora* cannot with
strict

strict propriety be termed a disease, yet, as it is the parent of numerous maladies, we deem it useful to state a few hints for the relief of the plethoric. Such persons ought to *adopt a more temperate diet*; to take frequent and moderate exercise, especially by walking early in the morning; to lose occasionally a few ounces of blood, by the application of leeches to the temples; and to regulate the bowels by the mildest cooling laxatives, such as sweet whey, boiled prunes, roasted apples, &c. If, however, the complaint originate from the cessation or suppression of any natural evacuation, the removal of such impediment, together with the attention paid to the regimen above directed, will in most instances restore the patient to his former health and vigour.

PLEURISY, or *Pleuritis*, is an inflammation of the membrane, called the *pleura*, which lines the cavity of the chest, and covers internally the ribs, intercostal muscles, and lungs.

The characteristic signs of this dangerous disorder are, fever; a hard, full, and tense pulse; an acute pain in the side affected, that increases both on inspiring and attempting to lie down; straitness and oppression of the chest; with a painful cough, which is at first dry, afterwards humid, and frequently accompanied with the expectoration of mucus streaked with blood.—Those causes that produce inflammation of the lungs (see p. 133, of the present volume) are likewise apt to occasion pleurisy; beside which may be mentioned, the disuse of blood-letting, after a person has strangely been accustomed to lose blood, at stated periods; also keeping the body too warm; a plethoric habit; and worms.

Beside a most rigorous abstinence from animal food, heating liquors, and every kind of irritation, either by the indulgence in passions, or exercise of body or mind, the first remedy to be employed in a pleurisy, is copious bleeding, either with the lancet, or by means of leeches. These evacuations should be repeated after 12 or 14 hours, if the violence of the pain do not abate: and, if the symptoms still continue, or the blood present what is termed a *buffy coat*, the operation must be performed a third, or even a fourth time; with a view to save the patient's life.—Blisters, fomentations, and warm cabbage, or other leaves, have often with advantage been applied to the painful side. With similar success, gentle emetics, and purgatives, have been administered in particular cases; and, if the patient neither perspire nor pass any urine, small but frequent doses of camphor and nitre have generally procured relief.—In other respects, the treatment, as well as the diet and regimen, varies but little from that already stated under *Inflammation of the* LUNGS, to which article the reader is referred.

PLOUGH, in agriculture, a machine for breaking or turning up the soil, by the draught of cattle; and which, in general, consists of a train or carriage, furnished with two large irons (the one being pointed, while the other has a sharp edge), that serve both to cut or open, and also to draw furrows in the land.

> "Ye generous BRITONS venerate the PLOUGH,
> And o'er your hills, and long withdrawing vales,
> Let autumn spread her treasures to the sun."
>
> THOMSON.

No implement has more essentially contributed to the comforts of mankind than the plough; for, without this contrivance, much time, labour, and expence, would be wasted, in digging the ground, and preparing it for the reception of seed. Hence, ingenious men have invented a variety of ploughs, many of which are at present employed by British farmers; but, as a detail of their various constituent parts (however interesting to *agricultural* readers), would exceed our limits, we shall confine our attention to an account of such machines as deserve more particular notice.

The *Rotherham-Plough* is too well known to require any description of its various parts: its simplicity, together with the facility of its draught, have recommended it in preference to the unwieldy machines formerly used in Scotland, and various parts of England.—This valuable implement has, within a few years, been reduced in size, and otherwise improved, by Mr. Small, of Rosebank; who, we understand, obtained a patent for his contrivance. In its present state, the wood-work is composed of ash or elm; and the plough differs from that commonly used, chiefly in the *bridle*, with which it is furnished at the end of the beam: this enables the ploughman to give the implement a more effectual power of action, and also by means of certain holes that are made in the beam, to cut the soil to a greater or less depth, as occasion may require. Another peculiarity that distinguishes the Rotherham from the common plough, consists in the *coulter* and *share*, which are so constructed, and fixed, as to cut off the new furrow, without tearing it. Lastly, according to Mr. Small's plan, the mould-board, being a plate of cast-iron, is so curved as to make less resistance to the earth turned up, and consequently requires a smaller force to draw it, than the common ploughs; while the furrow is gradually laid over to its proper position.—This plough is not provided with wheels; is light and convenient; it costs, we believe, from 40 to 50s.; and deserves to be introduced into the southern counties.

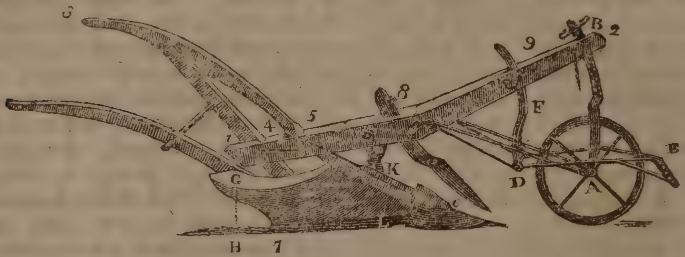
The *Kentish Turn-wrest Plough* consists of an oak beam, about ten feet in length, five inches in depth, and four inches in breadth; to the end of which is *tenoned* a *foot*, or piece of timber (3½ feet long, 4 inches thick, and 3½ inches broad) that is mortised at the bottom, to the end of the *chep*. The handles are fixed on the top of the beam, through which, at the distance of two feet five inches from the foot, is passed a *sheath* of oak, seven inches in width, and an inch and a half thick, being mortised into the chep in an oblique direction, so that the point of the share will be two feet ten inches asunder from the beam. The *chep* is five feet in length, four inches in width, and five deep: to this is fixed the share, which weighs about 32 lbs. and is manufactured of hammered iron, being one foot eight inches in length, and from four and a half to seven inches wide at the point. The upper end of the beam is supported on a carriage, furnished with two wheels, that are three feet two inches in height; on the axle-tree of which a gallows is placed, and provided with a sliding bolster, for the purpose of raising or lowering the machine. A *clasp-iron* likewise enters through the axle, to which a strong chain, or a *tow* passing over the beam, is fixed in such a manner, that the plough may, by means of notches, or a pin known under the name of a *cheek*, be let out to a greater length from the axle; and will consequently penetrate more deeply into the earth.

We have been induced to give this description of the Kentish Plough, because it is an instrument of great strength, and eminently calculated for rocky and hilly countries, as it turns the soil to a considerable depth, laying it perfectly level, without making any furrow, or opening; a circumstance of equal advantage and importance, in dry situations.—The price of the whole, with its tackle complete for drawing, is computed to be about five guineas.

A valuable implement has very lately been introduced into the county of Lancaster, by Mr. DUCKETT, jun.—It is denominated a *Trench-plough*, and furnished with two shares, one being directly over the other, so that one narrow superficial furrow may be drawn from the surface of the soil, while another, at a moderate depth, is taken off beneath. This machine is well adapted for ploughing-in green crops, or long dung, by way of manure; and, if the surface of the soil be *foul*, it may be turned under, and fresh soil brought up, from the depth of 10 inches, by employing three horses. The earth being thus loosened, the roots of plants are enabled to strike downwards without any impediment; and, while the land is drained, and exposed to the influence of the air, it is thereby considerably improved.

The *Scalp-plough*, or *Extirpator*, as it is generally termed, was lately invented by Mr. HAYWARD, of Stoke-Ash, in the county of Suffolk. Its beam is seven feet in length, and is furnished with two handles. The shares are eight inches broad, nine in length, and are fixed to *stalks*, about ten inches in height, and eleven inches asunder. Such implement may be adapted to the wheels of a common plough, and will penetrate the soil to a greater or less depth, in a similar manner. The object of this contrivance is, the eradication of weeds, and the clearing of ploughed lands for seed; in which respect it is said to be more serviceable than any other instrument. Before the extirpator is employed, the soil ought to be once ploughed; and, if it have lain fallow during a summer, the scalp is passed over it twice; namely, the first time about two inches deep, and the next, in a transverse direction, at the depth of about four inches. This operation, together with harrowing the ground once, will not only destroy all weeds, but will pulverize and prepare the soil for the reception of seed, whether drilled, or broad-cast. Farther, if lands, intended for the production of spring-crops, be ploughed in autumn, and the extirpator be afterwards passed over them, they will be rendered fit for immediate sowing.—This machine may be drawn either by two or by three horses, according to the nature of the soil, and the depth required: it possesses the peculiar advantage, that it may be worked on all arable lands, by any person capable of directing a plough, and that it will turn over an acre of ground, in one hour, without fatiguing either horses or oxen.—Should the soil, however, be overrun with weeds, it will be advisable to plough it with the scalp, twice; and, in some cases, three times; a short space being allowed to intervene, with a view to deprive the weeds of their vegetating power.

Among the most valuable implements that have, within a few years, been constructed and adopted in this country, is the *Beverstone Plough*, designed, or at least improved, by the ingenious Mr. Lewin Tugwell, of Beverstone, in the county of Gloucester. The following cut and description will afford a distinct idea of its mechanism :



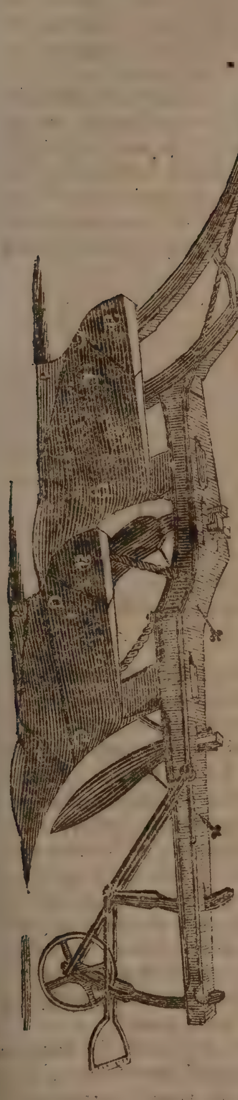
Dimensions of the Beverstone Plough.

	Feet.	Inches.
A to B - -	2	4
A — C - -	2	5
C — D - -	1	4
D — E - -	2	5
Diameter of the wheel	1	9
D to F - -	0	11
G — H - -	0	10½
E — I - -	1	3½
K — L - -	0	9
Breadth at the heel	0	9
Breadth of the fin -	0	7
Top of beam at the heel to the ground -	0	8½
The mould-board projects at the top more than the breadth at the heel -	0	6
1 to 3 - -	6	0
3 — 4 - -	3	8
3 — 5 - -	4	3
5 — 6 - -	2	5
7 — 6 - -	2	8
1 — 3 - -	1	5
1 — 8 - -	2	10
1 to 9 - -	4	8
From the heel to the tuck-hole of the share -	2	6½
From the tuck-hole to the point of the share -	0	8½

This excellent machine, which considerably varies from the Rotherham, and other valuable ploughs, gained the prize at the *ploughing-match* in 1798, held near Pipers-Inn, Somersetshire, under the patronage of the Bath and West of England Society. It may be easily worked by a pair of oxen, without a driver; and, on account of its simplicity, we believe that the representation, above given, will be sufficient to guide a skilful carpenter, in the construction of a similar implement.

The *Double*, or *Two-furrow Swing* and *Wheel-Plough*, demands the attention of every enlightened agriculturist : we have therefore subjoined the following representation, copied from the 2d vol. of *Commu-*

Communications to the Board of Agriculture:



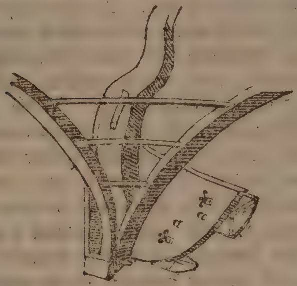
This machine, we understand, was originally invented by Mr. Duckett, but has lately been materially improved by the patriotic Lord Somerville. The construction of the beam is nearly the same as that of the Beverstone Plough; which his Lordship (in his Address to the Board, in 1798) acknowledges to have adopted, from a consciousness of his inability to substitute another more adapted to the purpose. The chief and most important improvement relates to the mould-board, one end of which was formerly cut off, and the deficiency supplied by driving in wedges, to the consequent injury of the mould-plate. As this expedient, however, was attended with much trouble, it was generally omitted; and, consequently, the land imperfectly tilled. With a view to remedy such inconvenience, Lord S. proposes (after the mould-board is formed, and the plate is fitted in the usual manner) to cut off the parts marked a a, in the delineation before communicated, and to connect them again with the fixed part of the board, by means of flat hinges, or of thin, flexible plates of hard-hammered iron; so that those parts may be easily set to have different inclinations with such fixed part, by the aid of two screws that pass from the inside through the lower parts of the handle of the plough, opposite to the backs of the moveable pieces a, a. The screws, he observes, may be so regulated as to keep such pieces at any degree of inclination that may be required, according to the nature of the land intended to be broken up.

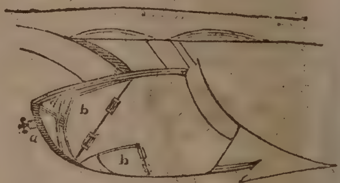
The Two-furrow Plough is best adapted to light, and level soils, particularly for stirring *ley-grounds*; and, as these cannot be laid too flat, or *seed-earths* be turned too

much

much on an edge, the plough may be adapted to either purpose with the utmost facility, by this improvement of the mould-board. When the moveable parts, above alluded to, are screwed outwards, a proportionate convexity or elevation will be left at the base of the furrow; and thus more earth will be exposed for covering the seed. Lastly, as the part of the mould-plate, marked with the dotted lines C C, is most liable to wear off by repeated friction, Lord Somerville directs it to be made twice as thick as the other parts of the plate; viz. double "the thickness of a new crown-piece," or about one-fourth of an inch; in which case it will remain unimpaired, nearly as long as the whole of the machinery.

The chief improvement made by Lord Somerville being in the mould-plate of his useful plough, we have subjoined two figures, representing its internal structure, in different points of view, by which its mechanism may be more clearly understood.





a, a, a, the screws that advance or withdraw the moveable mould-plate.

b, b, the moveable plate.

c, c, ribs, which serve to strengthen the plates.

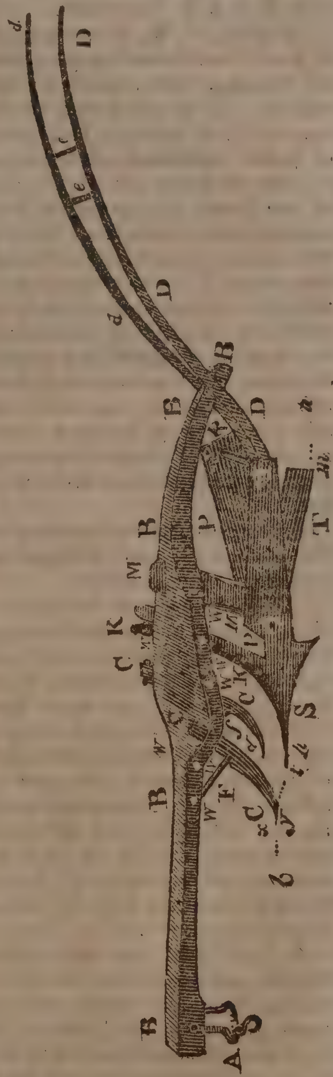
d, grooves, sunk in the mould-board for the reception of the ribs, when the mould-plate is withdrawn.

Lord S. observes, that "the principle of this moveable plate may not at first catch the attention of every reader;" but it deserves to be generally adopted, and has indeed met with strong advocates in ploughmen; for it not only relieves their right arm of considerable labour, that must otherwise be performed in wedging and hammering mould-plates; but much exertion is also saved to the right leg, in attempting to tread those furrows flat, which had been left on an edge by the plough. Lastly, these plates are indispensably necessary, in order to qualify two-furrow ploughs for all *broad* work, and particularly breaking up leys; and such implements ought (in the technical phrase) *to work on their own base, close at heel*; as otherwise the furrow will be irregularly laid; and they will be immediately "thrown out of work."

Before we conclude the account of this valuable contrivance, it is but justice to state the result of a trial made at Kew, in March 1799, on His Majesty's Farm, in consequence of a challenge given to Lord Somerville. The quantity of land, till then in a state of nature, amounted to $17\frac{1}{2}$ statute acres, and was worked by this implement, four Devonshire oxen (six years old), and a man, with a boy as driver, in six days and four hours. The cattle were in good condition when they commenced the task; after the accomplishment of which, they appeared in better order than before. They were allowed no corn; consumed every day, upon an average, about 40lbs. of hay, during their continuance at Kew; and worked eight hours each day, including half an hour for bait.—The land, thus tilled, was viewed by many gentlemen and able agriculturists, who highly approved of it, and were induced to order numbers of these ploughs; which, we trust, will soon be generally adopted.

The two-furrow plough has, indeed, been introduced into some of the midland counties, where it is employed with five horses and one man, in tolerably level soils, which it divides as effectually as two single ploughs.—It is also used, together with the single-wheel plough, in Staffordshire; as it requires only a lad to drive the horses, and to turn the plough at the end of the furrow.—For breaking up the turf, an iron *flay* is screwed to the coulter; by which the sward is cut off, and turned into the furrow, so as to be covered with earth. Thus, by the aid of an additional horse, the soil will resemble a fallow, and may be harrowed with equal facility.

The latest British plough, which merits particular notice, is that invented by Mr. J. Turner, jun. of Bockleton, Warwickshire; and of which the following figure will convey an accurate idea:



A, The iron at the end of the beam, to which the horses are hooked; and which is called, in Staffordshire, the *buck*; in the county of Worcester, the *ear*.

B, B, B, B, B, The beam.

W, W, W, W, W, A strong piece of wood, denominated by the inventor a *wing*, that projects in the middle; and in which one of the coulters C, is fixed. This piece of timber is fastened, at a proper distance from the *ear*, to the side of the beam, by means of long screws passing throughout the latter; with the opposite side of which they connect another wing, containing a second coulter, likewise marked with the letter C.—These two coulters are placed in a parallel direction, and are both strengthened with a piece of iron, called the *stay*; one end of which is fixed about two inches beneath the wing, and the other is inserted in the wing itself.

F, represents the whole *stay* of the coulter C; and *f* delineates part of the other coulter C.

T, denotes part of the *drock*, a piece of wood, that forms the lower extremity of the plough; and which is about six inches in width, three in depth, and rather more than two feet in length.—To the top of the drock is fastened an erect piece of timber, known by the name of *spindle*, M, M; and behind which are two tails, D *d*.—To the upper end of the spindle M, is fixed the beam B, the end of which is fastened between the tails, by means of an iron pin.

P, I, and P, R, are two *shelve-boards*, combined with the drock and spindle; and which meet at the angular point P. The ends of both these boards are strengthened by means of a short *wooden stay*, that is fixed in them, as well as in the tails: g, represents this stay.

K, a coulter fastened to the plough-share S, and which is bent at the end, in order that it may be more easily admitted through a hole in the beam, behind the two coulters C, C, when the share is put on the end of the drock.

The object of this contrivance is the formation of small drains or gutters in meadows, and pasture-land, with a view to carry off stagnant waters; which, by remaining on the surface, materially injure the soil.—To adjust the plough for work, a mark is first made in the middle of that end of the drock, which is contiguous to the tails; when a straight line is traced on a level spot of ground, on which such mark and the point of the share are put, and made to coincide. Next, the fore-coulters must be equi-distant from the line; then let the dotted line *b*, *y*, *p*, *n*, represent a straight line made on level ground; *p*, the point of the share S; *m*, the middle point of the end of the drock T; and, if *m* and *p* correspond with the line *b*, *y*, *p*, *n*, *xy*, and *dt*, will describe the distance from each of the fore-coulters.

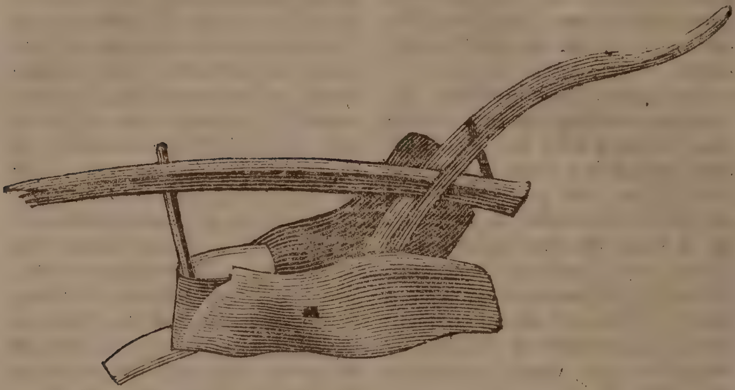
The most effectual method of working this plough is, in the opinion of its inventor, to fasten a chain round the axle-tree of a pair of cart-wheels (the body of which has been taken off); to hook such chain to the ear A, at the end of the beam; and, by lengthening or shortening the chain, this machine may be so regulated as to penetrate the soil to a greater or less depth, according to the nature of the ground.—When the plough is at work, the fore-coulters C, C, cut the outside of the gutter.—K, the coulter, divides the ground exactly in the middle: the farther shelve-board throws out half the soil on one side, while the *near* shelve-board removes the other half to the opposite side; and thus a complete gutter is left, which extends from eight to ten inches in width, and is from six to eight inches deep.

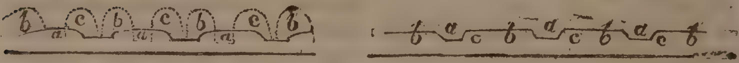
One of the most important advantages resulting from this invention, is the saving in manual labour, which is computed at *three-fourths*; as 400 perches of land may thus be drained in one day, by a team of five horses, two drivers, and a holder; the expence of which, the inventor calculates at 16s.; whereas, if the same quantity of land were to be dug by *hand*, the cost would amount to 3l. 6s. 8d.

Mr. TURNER's Plough may be applied to another valuable branch of agriculture; namely, the *planting of potatoes*. His method is as follows: First, trenches are made with the machine, at the distance of about two feet from each other; and in which the potatoes are set. Some manure is next spread on them in such trenches, and they are covered by drawing the plough through the intermediate spaces; so that each trench is filled by a ridge of soil. When the growing potatoes require an additional covering of mould, the weeds are previously cut, either by a hoe or weeding-hook; and, the two fore-coulters being taken off the plough, the implement is drawn between the ridges; it throws up an additional portion of soil upon them; and thus expeditiously effects the operation of *moulding*.

Beside these, now described, several other ploughs have been contrived for particular purposes; but, having already given an account of the most valuable improvements, under the heads of DRAINING, and DRILLING, we shall conclude the present article with a description (extracted from M. SIMONDE's "*Tableau de l'Agriculture Toscane*," 8vo. Geneva, 1801) of two ploughs, that are used in Tuscany, as well as in other parts of Italy; and which, from the simplicity of their construction, deserve to be more generally known in Britain.

The first is denominated the *Greater Tuscan Plough*: the sock is an iron plate, somewhat concave, which is from eight to nine inches, both in breadth and in length; it is sharpened on every side so as to divide the soil in an horizontal direction, and with great ease. The coulter is perpendicular upon the angle of the sock; and a moveable board *(versoir)* is placed flat over the chep, in such a manner as to form a continuation of the sock, and to pass under the clod which the latter has raised: but, as it describes a curve on the side opposite to that of the coulter, it deviates from the line, and is turned upside-down, together with the soil which it has received. The implement, thus constructed, meets with the smallest possible resistance in working the ground; its sock divides the earth with a facility equal to that of a common spade; and, as its motion is continued, it acquires greater power of action than the latter: — the coulter also, being vertical, passes on with less difficulty than such as are always in an inclined position. Lastly, the Italian mould-board being flat, receives the soil from the sock, which it turns over to the side, without increasing the resistance encountered by the implement, in consequence of this secondary operation.





The *Lesser Tuscan Plough*, of which the following representation will afford a tolerably distinct idea, is lighter, and more diminutive in all its dimensions, than the preceding. Its sock is of a similar shape, but the coulter is perpendicular beneath its beam, between the course of the sock; and, instead of the mould-board (of which this machine is destitute), its broad chep is formed in the shape of a plane *(doloire)*, so as to turn the earth equally on both sides. In order to work the plough, the labourer conducts it between each border *(plate-bande)*, which he divides at a single stroke, thrusting the soil of either side towards the furrow of the preceding year: and, while the latter is nearly filled up, he forms the trench, which is to continue open during the next season; so that the soil is alternately stirred, according to the system of Mr. TULL; being sown one year, and serving as a furrow in the subsequent.—This alternation is delineated in the foremost of the two lines, in the cut above annexed; where the lines represent the ground previously to its being ploughed; and the points or dots, its external form, after such operation.

The plough enters at *a a*, dividing each border; and, in throwing up the soil equally on both sides, it forms the small elevations *b*, *c*.—Thus, the field presents alternately, after ploughing, two ridges adjoining to each other, and then a furrow. Next, the labourer passes a small square harrow over these elevations, which he levels; while the furrow remains untouched, as represented by the second of the lines in the cut last referred to; and the soil is thus ultimately prepared for sowing.

The agricultural reader will observe, from the construction of these implements, that they are not calculated for working stiff clays; as the ground cannot be entirely removed, and some part must even remain untouched. But, in the rich friable soils of Tuscany, the smaller plough is a most useful instrument; for, in that country, the least effort is sufficient to divide and pulverize the land: we have been induced to communicate the figure above-mentioned, chiefly on account of its simplicity, and as there are similar soils in the Southern parts of Britain; where, we conceive, the Italian ploughs may be advantageously employed.—Lastly, the deep furrows, that remain in the ground after it has been ploughed, present a greater surface to the action of the sun and air; a circumstance materially conducing to its improvement.

We have here given an extensive view of the subject, on account of its *national importance*.—Justice, however, impels us to mention another contrivance, for ascertaining the force necessary in the draught of various ploughs. It was presented to the public by Mr. MORE, the late ingenious Secretary to the Society for the Encouragement of Arts, &c.: it consists of a spring coiled within a cylindrical case, which is furnished with a dial-plate numbered in a manner similar to that of a clock; and which is so constructed, that the hand moves in consequence of the motion of the spring, and points to the numbers according to the force exerted: thus, if the draught be equal to one cwt. over a pulley, the hand will be directed towards figure 1; when the draught equals two cwt. it points to figure 2; and continues to increase, or diminish, its progress in proportion to the exertions made.

Various experiments were conducted under the inspection of the Society, when the accuracy of this machine was fully evinced; a detailed account of which is inserted in the first volume of *Annals of Agriculture*; where the different results are minutely recorded.

PLOUGHING, in rural economy, denotes the stirring and turning over of land with the plough.

This is one of the most essential operations in the culture of the earth, and requires to be performed with the greatest care. Whatever, therefore, may be the design of the farmer, or the destination of the ground, thus moved, it ought never to be ploughed in a wet state; because the soil cannot be improved by such labour. Farther, the plough ought to be carried to a considerable depth into the soil; and, if one turning be not sufficient, it will be advisable to pass another plough over the same furrow, so that the land may be effectually stirred; when, being thus exposed to the air, its fertilizing properties will not only be considerably augmented, but all perennial weeds will be completely eradicated.—Deep ploughing, however, is unnecessary for land that has been recently manured with lime or marle; but, on exhausted soils, it is uncommonly beneficial, and has, therefore, been generally recommended by the most skilful husbandmen.

Ploughing increases the food of plants; as it opens the soil for the reception of vegetable aliment from the air; and, the surface being consequently enlarged, a greater portion of land is thus exposed to its influence. Farther, by *breaking up* the ground, if it be too solid, and rendering it firm, in case it be too light, this operation greatly tends to improve the earth; and, as weeds and other vegetable substances are thus reduced to a state of putrefaction, it promotes the nourishment of the new roots. Lastly, ploughing removes too great humidity, by forming the land into RIDGES (which see), and contributes to the eradication of weeds; as it first causes their seeds to vegetate; and, afterwards tearing up the young plants, exposes their roots to the drought; in consequence of which, they are deprived of their vegetative power.

PLOUGHMAN'S-SPIKENARD. See FLEA-BANE.

PLOVER, the COMMON, or *Charadrius Pluvialis*, L. a well-known bird of passage, frequenting chiefly the Northern parts of Britain, particularly the Hebrides, where they sometimes appear in flights of many thousands.

Plovers delight to feed on ploughed land near the sea; they utter a shrill whistling noise, and may be easily enticed within gun-shot, by a skilful imitator of their note. In the spring, before they form an acquaintance with *teal*, and other shy birds, plovers are readily taken by nets. For this sport, the month of October is the most eligible; and, as all sea-fowl fly against the wind, advantage should be taken of this circumstance, in setting the net. Contrary to the nature of land-fowl, these birds never roost on trees or hedges, but sit on the ground, in a manner similar to ducks or geese; though, in stormy weather, they frequently retire to some sheltered situation.

The flesh of plover somewhat resembles, in flavour, that of widgeon, teal, and other wild-fowl, but it is milder, and consequently more nutritive.

PLUM-TREE, or *Prunus*, L. a genus of plants, comprising fifteen, but according to BECHSTEIN, thirty species; five of which are reared in Britain, namely:

1. The *Padus*, or BIRD-CHERRY; and,

2. The *Cerasus*, or COMMON WILD CHERRY; see vol. i. pp. 509—10.

3. The *insititia*, BULLACE-PLUM, or BLACK BULLACE-TREE, which grows in hedges, and flowers in the month of April.—The fruit of this species is of an austere, but pleasant sub-acid taste, especially when it has become mellow by the frost. It is of a dark-blue colour (there is also a variety which is white); of a globular shape; double the size of common sloes; and next kin to plums. In Germany, it is preserved in vinegar and spice; though the Bullace-plum may also be profitably converted into brandy.—The wood of this tree is beautifully veined, and highly prized by turners.—The bark of the roots and branches has styptic properties; and Dr. WITHERING observes, that an infusion of the flowers, sweetened with sugar, is a mild purgative, well adapted for children.

4. The *spinosa*. See SLOE-TREE.

5. The *domestica*, or COMMON PLUM-TREE; which abounds in hedges, where it is supposed to be propagated from stones planted by birds. It delights in lofty situations, and does not prevent the grass from growing beneath its shade.—Its bark imparts a yellow dye.

Numerous varieties of this species are raised by gardeners, of which the following are the most remarkable:—1. The *Lord's Plum*; and 2. the *Ladies' Plum*; see p. 297.

297.—3. The *Red Perdrigon*; see p. 298.—4. The *Hungarian*, or *Blue-egg-plum*; see p. 306.—5. The *St. John's-plum.*—6. The *Royal*; and 7. the *Green*, or *White Indian-plum*; see p. 311 of this volume. To these may be added, 8. The *St. Julian*, and—9. The *Magnum-plums*; which, being very hardy, are chiefly employed as stocks for raising peaches.—10. The *Jean Hative*, or *White Primordian.*—11. The *Early Black Damask*, or *Morocco*; which are principally valued on account of their early maturation.—12. The *Great Violet Damask of Tours*, that attains a considerable size: externally, it is of a dark-red colour; its flesh is yellow, and possesses a rich saccharine taste.—13. The *Fotheringham*, or *Sheen-plum*; a large fruit, which is equal to any of the numerous varieties, both for beauty, and delicacy of flavour.—14. The *White Perdrigon* is in great esteem: it may be used either for sweet-meats, or eaten in a fresh state.—15. The *Violet* is a very delicate fruit, but is seldom produced in abundance.—16. *Imperial*, or *Red Magnum*; a large, long plum, of an austere taste; is excellent for sweet-meats; and the tree is very fruitful.—17. The *Bonum Magnum*, *White Holland*, or *Mogul Plum*, is very plentiful; and, when ripened against the wall, acquires a good taste: it may be easily preserved.—18. The *Mirabel*, is a small yellow plum, with a saccharine juice, and in great abundance.—19. The *Apricot*; a large, yellow, round plum, the pulp of which is firm, sweet, and will be much improved by ripening against a wall.—20. *Roch-courbon*, or *Red Diaper*, one of the most excellent varieties of the plum-kind: it is of a large size; a red colour; and has a sweet taste.—21. The *Gage*, is reputed to be equal in flavour, beauty, and in other respects, to the best plums that are cultivated: it is very productive, whether it be planted against a wall, or in an open exposure.—22. The *St. Catharine*, is principally calculated for sweet-meats. It produces abundantly, but requires to be reared against a wall, by which means its fruit is greatly improved, both in size and taste.—23. The *Spanish Red Damask*; a round plum of a middle size: it thrives best under the shelter of a wall; has a red tinge, and abounds with rich juice.—24. The *Muscle Plum*, is one of the most common kinds; and of an indifferent flavour.—25 The *White Pear-Plum* ripens at a late period: it is chiefly cultivated for stocks, on which tender peaches may be *budded*.

All the different varieties of plums have originally been raised from the stones, and afterwards grafted or budded on plum-stocks. The best for this purpose is the Sloe-tree, or Black-thorn; and, as the operation varies but little from that already described under the heads of ENGRAFTING and INOCULATION, we refer the reader to those articles.

Beside their utility as a culinary fruit, plums possess valuable medicinal properties. In a dried state, they are called *Prunes*, and are eminently useful in cases of costiveness accompanied by irritation, that would be aggravated by powerful laxatives; but they ought not to be eaten after long fasting, or for supper, unless mixed with other aliment; as they are apt to produce flatulency. With this exception, they suit almost every constitution, and produce both cooling and aperient

rient effects; but, when prunes do not operate sufficiently, their power may be increased by combining them with a small portion of rhubarb, or cream of tartar.

If *plums* be eaten in a fresh state, or before they are perfectly ripe, and in immoderate quantities, they induce colics, looseness, and similar affections in the stomach and intestines. The larger kinds, especially, ought to be used seldom, and with great precaution, being more dangerous than the smaller plums; because the former are rarely permitted to attain to maturity.

PLUME, or PLUMAGE, denotes the feathers of birds, which are frequently worn by military men, and females, as ornaments to the head-dress; a custom originally derived from barbarous nations.

Although we do not approve of such tinsel decorations in domestic life, yet, as the young and gay, especially in public places of resort, such as balls, masquerades, &c. are frequently liable to tarnish, or otherwise to injure the beauty of their costly feathers, we shall insert the following methods of cleaning them:—*White plumage* may be effectually bleached by dipping it in the oxygenated muriatic acid, or bleaching liquor of BERTHOLLET; and, if this cannot be easily procured, by simply immersing it for a few hours in pure water acidulated with oil of vitriol, in the proportion of six or eight drops of the latter, to every ounce of the former; then drying the feathers in the sun, or at a distance from a fire.—*Variegated plumage* may be cleaned and restored to its former brightness, by gently wiping it with a soft sponge dipped in spirits of wine; and, after it has been gradually dried, by moistening the downy part with a filtred solution of gum-arabic, or tragacanth;—then cautiously exposing the tops and sides to the heat of a bright fire, in order to curl their extremities.

POISON, a term denoting any matter that may prove detrimental, and frequently fatal, to the life of animals, whether it be taken in small portions by the mouth, mixed with the blood, or applied to the nerves by friction of the skin, or other means.

Poisons are divided into vegetable, animal, and mineral; but, as we state the particular substances, together with their appropriate remedies, in their alphabetical order; and, having already given the general precautions in case any poison have been swallowed (under the article ANTIDOTES), we shall at present add a few supplementary directions, to be followed in those situations, where poisoning has either actually taken place, or is strongly suspected.

I. In order to ascertain the nature of the deleterious matter, the remainder of the poisoned aliment (if any) should first be examined. The patient, as well as the persons present, ought likewise to be strictly interrogated, and the symptoms accurately investigated.

II. The next measure necessary to be pursued, is to learn the portion of the poison taken into the stomach; whether it was administered by mistake in medicine, food, drink, or in any other form. In this case also, attention must be paid to the symptoms, such as violent looseness, nausea, and vomiting, convulsions, swelling of the face, &c.—Lastly, the time elapsed since the swallowing of the poison, and the antidotes given, together with their operation, should be minutely inquired into, as well as the effects resulting from this unfortunate casualty, such as palsy, apoplexy, colic, &c.

Where poison has been recently swallowed, it may be discharged either by means of an emetic, or by tickling the throat with a feather, and administering such a quantity of oil, mixed with milk, as the patient is able to drink. But, if the accident be discovered several hours after it has happened, emetics would be productive of fatal consequences: it will, therefore, be advisable to prevail on the patient to take large draughts of lukewarm water, milk and oil, and to resort to tepid bathing.

POKER, a well-known instrument, generally manufactured of iron; and employed for stirring the fire.

As many casualties occur from negligence, or imprudence, in leaving pokers in the fire, we shall state the following expedient, by which they may in future be prevented. It consists simply in welding or soldering a small cross of iron (projecting about an inch and a half each way), immediately above the square part of the poker, called the *bit*. By this contrivance, the instrument cannot be thrust into the fire farther than such bit; a circumstance of some advantage, where fire-irons are highly polished. Besides, if the burning coals should yield, or any other accident happen, so as to cause the poker to slide out, it will probably be arrested on the edge of the fender. And, though it should fall on the hearth or carpet, neither of these will sustain any material injury; as the heated part or *bit*, will be elevated several inches above the floor.

POLE-CAT, or *Mustela putorius*, L. an animal of prey, of a dusky-yellow colour, with whitish ears and muzzle: it inhabits most parts of Europe; and, in temperament, manners, disposition, and form, resembles the Martin.

Pole-cats burrow under ground, forming a shallow retreat about two yards in length, which generally terminates under the roots of a large tree.—The female breeds in the spring, and brings forth three, four, and sometimes five young at a time.

These predatory animals approach our habitations, mount on the roofs, or take up their abode in hay-lofts, barns, and unfrequented places, whence they issue during the night, in search of prey. They occasion greater havock among poultry, bees, &c. than the Martin: with a view to obtain honey, they attack the hives in winter, and compel the bees to abandon them. When frightened, the pole-cat emits an exceedingly offensive fetor; which is so pungent and hurtful to fowls, that they sometimes fall down from the places where they roost; and thus become a prey to this quadruped.

For a method of exterminating these depredators, we refer to the article MARTIN.

POLL-EVIL, in farriery, is an abscess formed in the sinuses between the poll-bone, and the uppermost vertebræ of the neck of a horse.

When this malady is occasioned by blows, bruises, or any external violence, the swelled part should first be bathed with hot vinegar; but, if the hair be fretted off, and a discharge ooze through the skin, a fomena fomentation, prepared of two parts of vinegar, and one of spirit of wine, will be more proper. Should, however, great irritation arise from heat and inflammation, it will be necessary to bleed the animal, and to apply poultices of bread, milk, and elder-flowers; which method, with the assistance of appropriate physic, will frequently disperse the swelling, and prevent the farther progress of the disease.

But, when the tumor becomes *critical*, and contains fluctuating matter, its maturation ought to be promoted by poultices, till it either burst spontaneously, or arrive at a state proper for applying the knife. If such operation become necessary, it should always be performed by a skilful veterinary surgeon; as it frequently happens, that, though a complete cure of this evil be effected by common farriers, yet, by making deep incisions, resorting to corrosive mixtures, and a tedious course of hot, irritating applications, the poor animal is so disfigured as to be fit only for the meanest drudgery.

A more judicious and simple method of discussing tumors of this description, has lately been recommended by Mr. CLARK, of Edinburgh.—As soon as matter is perceived to fluctuate in the part affected, Mr. C. directs a large seton-needle, armed with a cord, to be introduced at the upper part of the swelling, and brought out at the under or lower part of it: from which orifice the pus will speedily discharge itself; and in a few weeks the wound will be perfectly healed, without leaving any scar or blemish, or the least trace of the disorder.—Deep-seated abscesses may be treated in a similar manner; and, if there be two or more sinuses, the same method may be adopted, in order to obtain a depending orifice, for a free discharge of matter: thus, a cure is generally and speedily effected.

POLLEN, or *Farina fecundans*, denotes the fertilizing powder, found in the anthers, or tops of the stamina of plants; and which, when sufficiently mature, is conveyed to the pistils for the purpose of fecundation.

The farina is, in general, of a yellow colour; it is very conspicuous in the tops of young or unripe flowers, and especially in those of lilies and tulips. It consists of minute hard particles, covered with one, two, or three elastic membranes, bursting and shedding the flower dust to a considerable distance, as soon as it has arrived at maturity.—When viewed through the medium of a microscope, they usually present a particular form, that is observable throughout the genera of an order, as well as all the species of a genus of plants.

Naturalists have discovered, that the pollen contains a waxy, unctuous matter, and is collected in the hairs with which the thighs of bees are covered. These insects triturate, and otherwise prepare it in their stomachs, whence it is ejected in a concrete form, under the name of WAX.

POLISHING, in general, denotes the act of smoothening and imparting brightness to hard substances, such as metals, marble, glass, &c. by rubbing them with certain matters adapted to the purpose.

Having, on many occasions, stated different mineral and vegetable bodies that may be employed with the view of polishing metals (a summary account of which the reader will find in the concluding *General Index of Reference),* we shall at present only remark, that one of the most proper articles, in this respect, is the *Asphodelus luteus,* L. or Common Yellow ASPHODEL, the useful properties of which we have described vol. i. p. 130.—The stalks of this plant are somewhat thicker than a goose-quill; and, when dipped in Calcothar, or *Crocus Martis* (which may be had of the druggists), reduced to a paste with sweet-oil, and properly applied to iron and brass utensils, will not only render them exceedingly bright, but also prove a better preservative from the rust, than sand-paper, or other rough materials.

POLYANTHUS. See PRIMROSE.

POLYPODY, or *Polypodium,* L. a genus of plants comprising 142 species; 18 of which are indigenous, but the following only deserve to be mentioned:

1. The *vulgare,* or COMMON POLYPODY, is perennial; grows on old walls, shady places, and at the roots of trees: it flowers from June till October.—The root of this plant has a sweetish taste; but, by long boiling, it becomes bitter. When fresh, it operates as a mild laxative, so that an infusion of six drams of this root, in half a pint of boiling water, may be taken in divided doses.

2. The *Filix-mas.* See FERN the Male, vol. ii. p. 262.

3. The *Oreopteris,* or HEATH POLYPODY, thrives on most of the dry hills of Scotland; also in moist woods, and mountainous situations of England. It flowers from July to October.—This plant is likewise perennial, and its leaves emit a very agreeable scent.

POMATUM, an unguent, which was formerly prepared from apples, lard, and rose-water, triturated together to the consistence of an ointment. At pesent, it is generally compounded by beating up lard with a certain quantity of rose-water, and communicating to the mixture the odours of violets, roses, jessamines, &c.

Pomatums are commonly used in dressing the hair; and as many are deprived of that ornament, chiefly by dissipation, mercenary adventurers amuse the public with various preparations, which are sold to the credulous with the specious pretence of rendering the hair long and thick. Such mixtures, however, consisting frequently of hurtful ingredients, we refer the reader to the directions already given, in vol. ii. p. 423.—These unguents are also occasionally employed for *beautifying* the face and skin; removing pimples, and other cutaneous eruptions; especially by those votaries of fashion and vanity, who are addicted to the use of ardent spirits, whether pure or mixed; and who endeavour to conceal the effects of such indulgence, by relaxing the skin with unctuous applications. Here we cannot too severely reprimand parents, and more particularly mothers, thus pitiably situated; because the momentary gratification of the palate, or a temporary exhilaration, appears to suppress every moral reflection, every duty they owe to themselves and their children; while they eventually render themselves victims of disease and misery.

POMEGRANATE-TREE, or *Punica,* L. an exotic, growing in chalky soils, and consisting of two species:

1. The *granatum,* or Common Pomegranate-tree, which is a native of Italy, and other southern parts

of Europe, where it grows to the height of 18 or 20 feet. In Britain, it is cultivated only in the gardens of the curious; as its fruit seldom attains the delicacy of that imported from warmer climates.—Among other experiments made with different parts of this tree, in dyeing, we shall relate only one mentioned by Böhmer. From the deciduous leaves in autumn, when they present a brownish-red shade, he obtained, by boiling them, a thick, muddy liquor, in which cotton, silk, and woollen cloths, acquired a good French-blue colour: these materials had been previously immersed in a solution of green vitriol; and, after becoming dry, they were, by different trials, plunged in vinegar, and soap-water, neither of which in the least affected their tint, so that it was doubtful whether they were dark-blue, or black. —In Germany, the tanners formerly employed the bark of this tree as a substitute for sumach.—See also Morocco-Leather.

2. The *nana*, or Dwarf American Pomegranate, has a short stem rising only four or five feet high, bearing narrow leaves, and minute red blossoms, which are succeeded by small fruit.—It flowers from June till October.

Both these species may be propagated by layers, that should be selected from young branches, and planted in autumn. They may be trained either as half or full standards, or as dwarfs; but, if the pomegranates are to be raised against walls, it will be advisable to pursue a treatment similar to that directed under the article Peach-tree.

The fruit of this shrub is agreeable to the palate; and, in common with other sweet summer fruits, allays heat, mitigates thirst, and is mildly aperient. Its rind is powerfully astringent; on which account it is, together with the bitterish red flowers, occasionally employed in diarrhœas, dysenteries, and other disorders proceeding from debility.

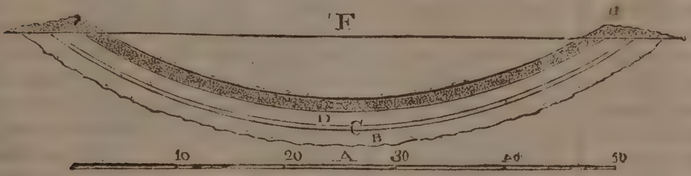
POND, a small pool, or collection of standing water.

Ponds are of great utility in agriculture, and for various other purposes: hence different methods and expedients have been devised, with a view to obtain a constant supply of water: from these we have selected the following, which appear to merit particular attention.

In the first vol. of the *Journal de Physique*, we meet with an interesting *method of making ponds water-tight, without the aid of masonry*, by M. Dambourney.—He directs the pit to be dug to a convenient depth; and its sides to be carefully sloped to an angle of about 40 degrees. The cement with which it is to be lined, should then be prepared in the following manner.

A sufficient quantity of brick-clay ought previously to be procured, in a moist state, so that it may be easily worked and incorporated with one-fourth part of quick-lime, slacked the preceding evening, in such a portion of water, as will reduce it to the consistence of cream-cheese; and the whole must be formed into balls, about two feet in circumference. When an adequate stock is collected, the workman descends into the cavity, and an assistant supplies him with a ball, which the former throws with all his strength on the ground, near the centre of the pit: thus, he continues the plastering with other balls, in such a direction that each may come in contact with the next following, till the sides and bottom of the intended pond are perfectly lined. If the whole cannot be finished in one day, the last row laid on in the evening should be moistened, in order that it may be sufficiently adhesive; to incorporate exactly with the new part of the work on the subsequent morning.—Two or three days after this composition is applied, it should be beaten with a flat piece of wood; and, accordingly as its firmness increases, the beating must be stronger, and the surface occasionally wetted, to prevent cracks, till it become one uniform, solid piece. Lastly, the whole is to be covered with a coat of any cheap oil; and (previously to the admission of water), with gravel, to the thickness of one inch. By this management, the coating will acquire a very remarkable degree of firmness; and, if the pond be constantly full, no repairs will become necessary; as the only injury to be apprehended, may proceed from intense frost, which is apt to damage such parts of the work as are exposed to the air.

In the sixth volume of *Annals of Agriculture*, an account is given of a simple method of making *artificial ponds, in dry soils*:—the subjoined cut represents an outline of their construction.



The line A, describes a circular hole made in the ground, of such size as may be found necessary; and on which a stratum of clay, B, must be carefully beaten, and trodden into a solid, compact body, from four to six inches in thickness.

C, represents a layer of quicklime about an inch, or an inch and a half thick; and which should be uniformly spread over the whole.

D, is a second stratum of clay, that ought to be of a thickness similar to that above-mentioned, and should be pressed down in the same manner.

E, denotes stones, or gravel, either of which must be spread on the second layer of clay, to such depth as may prevent the pond from being injured by the feet of cattle; for otherwise, they will penetrate the stratifications of clay and lime; in consequence of which, the water will be discharged through the pores of the earth. When thus completed, according to the section above given, the pond will remain five feet deep, and forty-five in diameter; at which size these reservoirs are in general constructed;—the letter F, representing the line of level, both of the water and of the ground.

This method of forming ponds was contrived in Yorkshire, about 25 or 30 years ago, by a well-sinker:—numerous artificial pools have since been made in that, as well as the adjoining counties. The expences attending a work of the dimensions above stated, are computed to be from 4l. to 6l. according to the distance from which the clay is carried. Such a pond will remain unimpaired for a series of years; because the lime prevents worms from striking either upwards or downwards, and consequently from injuring the clay, which naturally resists moisture.

Beside the utility of ponds, by affording a constant supply of water for various purposes, the MUD settling at the bottom furnishes an excellent manure. Hence it is a desirable object to draw off the fluid part, so as conveniently to arrive at the sediment: for this purpose, a hole or pit should be dug in the centre of the pond, as far as the stratum of sand, which usually lies under that of clay. Thus, the water will be immediately absorbed, and the pond completely emptied:—the sides of the cavity, however. ought not to be made so steep as to prevent the return of cattle, in case they should enter it by accident.

In the 8th vol. of the *Transactions of the Society for the Encouragement of Arts*, &c. we find a short account of a *Machine for draining Ponds, without disturbing the mud.* It was communicated by Lieutenant-Colonel DANSEY, together with a drawing and model, of which we have given an engraving.

Fig. 1. A, is the pipe, loaded with a rim of lead, of such a weight as serves to sink it beneath the surface of the water.

B, represents the discharging pipe, that is laid through the bank H, I.

C, the joint on which the pipe A, turns; and the form of which is delineated in Fig. 2.

D, the ball, or float, that swims on the surface of the pond, and thus prevents the pipe A from descending to a greater depth than the length of the chain, by which they are connected, will admit.

E, a chain that winds on the windlass F; and serves to raise the tube A, above the surface of the water, when the machinery is not in use.

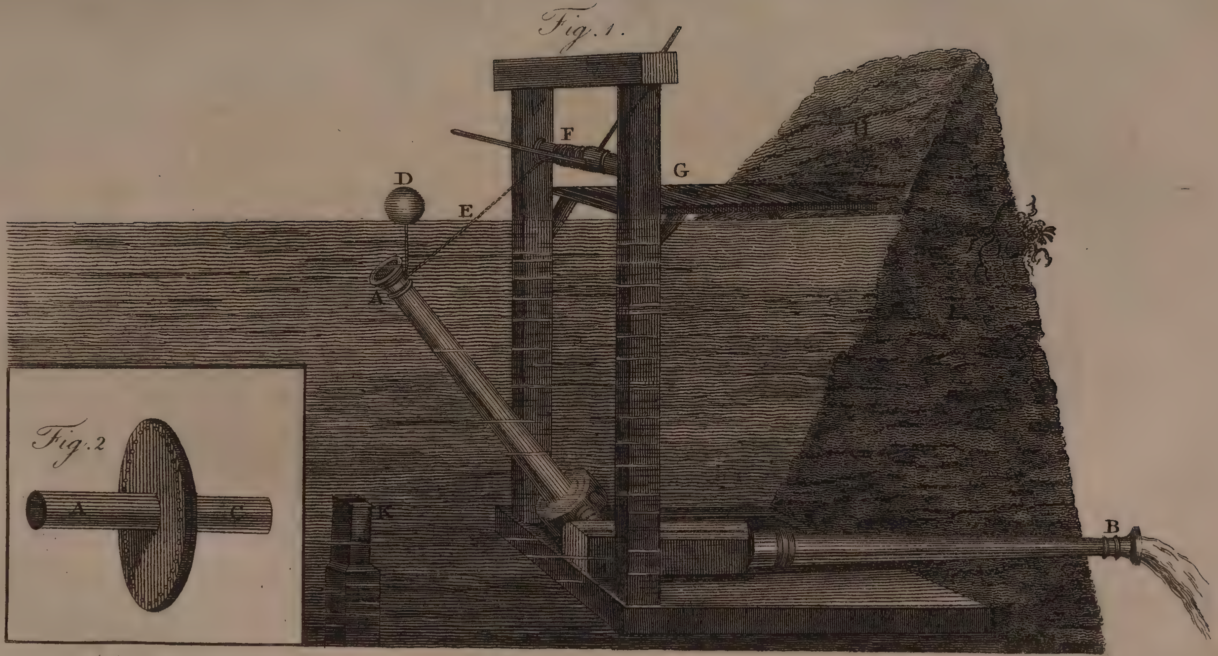
G, a stage.

H, I, the bank, which is represented as if it were cut through at I, in order to delineate the tube B, lying within it.

K, is a post designed for the reception of the pipe A, when the latter is lowered, and also for preventing it from sinking in the mud.

Fig. 2. A, is a cast cylinder, furnished with a brass plate or cheek, which is fastened to the timber of the tube, on one side only; because the part of the cylinder C, turns in the hollow of the wooden tube, when it is immersed in the water. A piece of strong sole-leather is placed in the inside of such plate, to prevent leaking.

The model represented in our engraving, was constructed from the description of a machine employed by a gentleman residing in the vicinity of Taunton. In the year 1788, Colonel DANSEY's regiment was quartered at Windsor; and, conceiving that the invention might be useful for the supply of the grand cascade at Virginia-Water, he presented the model before-mentioned to His Majesty, who graciously signified his approbation. In consequence of this event, a pen-stock was erected on the same plan, at one of the ponds in the vicinity.



Machine for draining Ponds without disturbing the Mud.

Colonel D. observes, in his communication to the Society, that he has often tried the model in a vessel of water; and, as the principle on which it is constructed, may be farther improved and extended, in the hands of ingenious men, we have furnished our readers with an accurate engraving:—this machine is applicable to silk, cotton, and other mills; where an uniform and steady velocity of water is required, which may at pleasure be regulated, without occasioning any current to disturb the fish, or mud; because the stream constantly runs from the surface.

POND-WATER, to which cattle generally resort for drink, is a fluid strongly impregnated with saline and oily particles: hence it should never be suffered spontaneously to evaporate during the summer.

For the important purpose of IRRIGATION (which see), pond-water is in every respect equal to the liquor collected in farm-yards. See also Fluid MANURES; p. 161 of this volume.

POND-WEED, the BROAD-LEAVED, or *Potamogeton natans*, L. an indigenous perennial plant, growing in ponds and slow rivers; flowering in the months of July and August.—The leaves of this weed float upon the surface of the water, and thus afford an agreeable shade to fish: its roots are said to be exceedingly grateful to swans.

POOR, an appellation given to persons, whose situation is so reduced as to render them chargeable to the parish.

Previously to the Reformation, the poor received alms, and other benefactions, from the monasteries, and religious houses; but, on the suppression of the latter, the wealth with which they were endowed, was diverted into other channels; and the poor, being thus left destitute, became a heavy burthen to the nation at large. In order to remedy this inconvenience, the 14th ELIZ. c. 5, and the 43d ELIZ. c. 2, were enacted, by which certain rates or assessments are to be levied for their relief; and which have been continued to the present day.

The 43d ELIZ. is generally regarded as the basis of the poor-laws in England; and, though it was framed with great judgment and circumspection, yet experience has evinced, that it is not calculated to produce the salutary effects, that were expected to result from these regulations. It would, indeed, be a task equally invidious and foreign to our plan, to point out the defects of any statutes that have been passed for the relief of the poor; yet, as this *national provision* (which prevails in no other country in Europe), has been considered as tending to produce consequences prejudicial to society, we shall briefly state a few of the objections that have been urged against its principle.

First, it is argued, such *compulsory relief* checks the spirit of industry, and frugality; because the apprehension of being in want at some future period, which would otherwise stimulate persons to exert themselves during health and youth, in order to provide against the approach of sickness and old age, must necessarily be weakened, when a prospect of receiving assistance from the parish is held out to the indigent. In consequence of such fallacious hopes, many unprincipled or phlegmatic individuals wilfully neglect to seize opportuni-

ties

ties of advancing in life, and obtaining an honest competence againt the day of want; so that, on the most trivial occasions, they become chargeable to the parish.

Farther, this *legal* relief is supposed to destroy every emotion of gratitude in those who receive it, and who are consequently led to imagine that they have a *lawful claim* to such assistance. These exactions apparently tend to extinguish *charity*, and to steel the hearts of the humane, even against a truly deserving object. It is true, the covetous are compelled to contribute towards the support of the poor, disabled, aged, and distressed; but the evils arising from such a system, more than counterbalance this advantage, and are eventually oppressive to many industrious families; who can ill afford to pay their quota of the poor-rates.

To remedy these notorious grievances, houses of industry, poor-houses, and work-houses, have been proposed and carried into effect. In some places, they have been attended with the most beneficial consequences; while, in others, the rates have continued to increase in a most alarming degree. This growing evil has been attributed (and we fear, in many cases, with too much justice), to the almost unbounded and resistless power, exercised by overseers in their respective parishes; who are, for the greater part, illiterate landholders, that are put into office, according to the routine of business, on account of their large farms, or other occupations. One of the most rational expedients that can be suggested, with a view to check such inconveniences, is the incorporation of the hundreds; and the appointment of men of *liberal education* to the superintendance of all affairs that respect the poor. Influenced by no selfish or pecuniary motives, they would conduct every part of their duty in the most economical manner; and the necessary consequence would be the reduction of the poor-rates:—indeed, experience has proved, in parishes, where the attention of liberal-minded men to parochial business was obtained, that a saving of *several hundred pounds* per ann. resulted to the benefit both of the poor, and of the house-keeper; but, as soon as *gentlemen* resigned their office, the old abuses were renewed, and the rates were annually augmented in arithmetical progression.

In the 25th volume of *Annals of Agriculture*, there is an account of a most humane method of assisting the poor, which must be interesting to every reader, who possesses the smallest drop of the "*milk of human kindness*."—In the parishes of Ashley, and Newton, Wiltshire; and Shipton-moine, Gloucestershire; the landlord, THO. ESTCOURT, Esq. allotted fifteen perches of land to every cottager, which were inclosed in one large tract, that contained a sufficient number of acres. As some parts of the soil were not perfectly level, lots were drawn, for the choice, by the cottagers, to whom every encouragement was offered, in case they diligently cultivated their gardens. The happy effects of this donation soon became evident: employment was furnished for the women and children, in planting potatoes, &c.; while the poorer inhabitants of those parishes, who had been dissipated, idle, and addicted to drunkenness, were gradually, by shutting up an ale-house, and repairing their dwellings, converted into honest, industrious, and valuable members of society.

We cannot, in justice, omit to mention the benevolent plan proposed by Lord SOMERVILLE. It consists in vesting a fund, for the reduction of the poor-rates, and the support of the aged, sick, &c. in the hands of proper persons. This fund is to be levied "either parochially, by hundreds, counties, or by one general accumulation of the whole kingdom," in certain proportions, according to the different classes, under the direction of respectable commissioners. For a minute account of his design, together with the arguments for and against the probability of its execution, the reader will consult his lordship's work, entitled, *The System followed during the two last years by the Board of Agriculture, further illustrated*, &c. (8vo. 2d edit. 1800.)—Some valuable remarks also occur in Mr. SAUNDERS's *Observations on the present State, and Influence of the Poor-Laws*, &c. (8vo. pp. 190, 3s. 6d. Sewell, 1800);—in Mr. BLEAMIRE's *Remarks on the Poor-Laws, and the Maintenance of the Poor* (8vo. pp. 36, 1s. 6d. Butterworth, 1800);—and, lastly, in the *Reports of the Society for bettering the Condition, and increasing the Comforts of the Poor*; of which the third volume is in the press; a work that is periodically continued under the patronage of that benevolent association.

POOR-HOUSE, an asylum appropriated to the accommodation of those aged, sick, or helpless poor, who are unable to support themselves: but, as such design is generally combined with *work-houses*, or buildings, in which the indigent, vagrant, or idle, are employed, and supplied with food and clothing, we shall communicate a few hints relative to their management.

In such places, the strictest regard ought to be paid to cleanliness; and, if the inhabitants be disorderly, a proper system of coercion should be adopted. The unruly must be confined in separate apartments; where they perform labour for their own support, being left to solitary meditations: these may be farther directed by the exhortations of a pious, well-informed clergyman, who is able to adapt his instruction to the peculiar circumstances, or case of the individual. We are aware that houses of correction have been established with this view; but, we conceive, that more salutary consequences would result from their general combination with the common poor, or work-houses.

There is, however, a strange system prevailing in several parishes of the metropolis, namely, that of *farming out* the poor; or contracting with speculative persons to support them *at a certain price per head*. This practice is carried on chiefly in the precincts of the city, where no work-houses can be conveniently erected, and in consequence whereof the poor are sent to a small distance.—Some of these *farms* are certainly conducted on the most humane plan, while the management of others deserve the severest censure. Surrounded with filth; confined in close situations; ill clad; and worse fed; the wretched tenants of such habitations, present the most haggard countenances; and the children reared in such places, instead of becoming healthy and vigorous, are weak, puny, and frequently fall early victims of disease!

ease!—The loud complaints of the poor have lately excited general attention; we have, therefore, mentioned these few circumstances, to induce the benevolent to bestow serious considerations on the subject, so that some measures may be devised for preventing such accumulated misery.

POOR-MAN'S PEPPER. See PEPPERWORT.

POPLAR, or *Populus*, L. a genus of trees comprising 13 species, of which the following are the principal, and the three first are natives of Britain:

1. The *alba*, WHITE POPLAR, or ABELE-TREE, grows in hedges and brooks, where it flowers in the month of March.—It delights in gravelly soils and lofty situations, though it also thrives in clay-lands.—This tree is remarkable for its speedy growth; as it attains its full size in 20 years; being, however, subject to excrescences resembling warts, that sometimes become exceedingly large; and, as they absorb humidity, occasion the tree to decay. Its wood is white, soft, though tough, and neither exposed to the ravages of worms, nor subject to warp or shrink: hence it is advantageously employed for wainscotting and floors; as well as for packing-boxes, laths, and turnery-wares.—The bark of the white poplar, according to the Rev. Mr. STONE (*Phil. Transac.* vol. 53), is eminently serviceable in curing agues. He gathered it in the summer, while abounding with sap; and, after drying it in a gentle heat, he administered one dram, in powder, every fourth hour, between the paroxysms. In some instances, he was induced to combine it with the Peruvian bark; but, in general, the former alone proved singularly efficacious.—The dried leaves in the winter afford excellent provender for sheep.

2. The *tremula*, TREMBLING POPLAR, ASP, or ASPEN-TREE, flourishes best in moist woods and boggy grounds, though it will thrive in all other soils, excepting clays: it is in flower during the months of March and April. This species impoverishes the land: its leaves destroy the grass, and the numerous shoots that spring from the roots, spread so near to the surface of the ground, as to prevent the vegetation of every other plant. The leaves are eaten by sheep and goats, but refused by horses and hogs:—the bark, when young, is made into torches. The wood is extremely light, smooth, white, soft, and durable in the air; and though inferior in point of excellence to that of the preceding species, it is usefully employed for pannels or pack-saddles, milk-pails, clogs, pattens, &c.—From the straight stems of this tree, the most durable shingles are obtained; and DU ROY observes, that bricks burnt with such wood, in a *green* state, acquire a blueish glazing, and additional firmness. Nor is it less excellent for water-pipes; for which purpose it should be felled from April to June, immediately bored, and laid under-ground. It is, however, remarkable, that the wood of the trembling poplar is very liable to be infested with bugs; and consequently improper for bedsteads.

3. The *nigra*, or BLACK POPLAR, grows very rapidly near rivers, and in shady, moist situations: it flowers in the month of March. The wood of this species is soft, light, and not apt to splinter. Its

bark is uncommonly light, resembling cork, and is therefore employed by fishermen to support their nets: the inner-rind is used by the inhabitants of Kamschatka as an ingredient in their bread.—The buds, which appear early in the spring, contain an unctuous, yellow, fragrant juice, which is the basis of BEE-GLUE (*Propolis*), and is employed only in ointments for plasters; though its medicinal properties recommend it for internal use:—if formed into a tincture, by means of rectified spirit, and then inspissated, the buds yield an odorous resin, that is reputed to be equal to many of the expensive resinous drugs imported from foreign countries.—The leaves afford a good winter fodder for cattle, and should be collected in October, before the branches are cut for faggots.—Lastly, the roots of the black poplar dissolve into a kind of jelly.—The wood is useful for the engraver; and, when sawed into boards, and sap-dried, is uncommonly durable.—DIOSCORIDES asserts, that the bark of this tree, when chopped small, sown in richly-manured ground, and well watered, will produce an abundant crop of eatable mushrooms: yeast diluted with warm water, and poured on a stump of the black poplar, will be attended with a similar effect; but these fungous plants ought to be gathered after the first autumnal rains.

4. The *fastigata*, PO-POPLAR, ITALIAN, or LOMBARDY-POPLAR, is a native of the northern parts of Italy: it also flourishes in moist situations; but will not succeed if its roots are too long covered with water.—On account of its rapid growth, this species is greatly esteemed for ornamental plantations: its cuttings are useful for hop-poles: the wood being soft, free from knots, and easily worked, it is much employed by joiners, carpenters, and cartwrights; it may be wrought into very flexible shafts for carriages, or fellies for wheels. Farther, it forms excellent masts of small vessels, and is particularly serviceable for packing-boxes; because the plank, yielding to the nail, is not liable to be split; and, in case the box, &c. be accidentally dropped on the ground, the boards are not so easily broken or splintered, as those of oak and other trees.—Lastly, it appears from numerous experiments made by DAMBOURNEY, that the Italian Poplar affords a dye of as delicate a lustre, and equally durable, as the finest yellow wood: its tinging matter is more readily extracted; but, instead of striking a proper green with indigo, it changes to an olive shade. The dry branches are preferable to those in a green state; nor should they be cut or bruised; being possessed of the property of fixing the colours obtained from Brazil and logwood.

5. The *balsamifera*, or CAROLINA POPLAR, is a native of Carolina, where it attains a considerable size. It is best adapted to boggy soils; and, as it grows with greater rapidity than any of the other species, it soon repays the expence of planting. Its wood is very soft, spongy, light, and principally employed for packing-boxes, though it also furnishes good posts for fences.—DAMBOURNEY obtained from the Carolina, as well as the other poplars, a fine fawn, nut, and similar grave colours for wool, according to the quantity of wood employed, and the length of time it was boiled.—The balsamic juice,

expressed from the flower-buds, is probably the American *Tacamahaca*, an excellent application to recent wounds, provided no nerves or sinews have been injured.

All the Poplars may be propagated either by layers, cuttings, or suckers, which should be planted in a nursery for two or three years previously to their removal. The most proper time for transplanting suckers is in October, when their leaves begin to decay; but, if the trees are to be reared from cuttings or layers, it will be advisable to set them in February, when they ought to be put about a foot and a half deep in the ground, and closely rammed in. These will speedily take root; and, if the soil be moist, will in a few years attain a considerable size.

To conclude this interesting article, we shall briefly state an important fact which deserves the attention of those who are in possession of numerous *poplars*. The different species of these trees produce, on the upper part of their seed-vessels, a woolly or downy substance, which is of considerable value: by combining it with cotton, Prof. Herzer, of Munich, has lately converted this composition into wadding, counterpanes, gloves, stockings, &c.—From a mixture of two ounces of the down before mentioned, and four ounces of hare's wool, he obtained excellent hats; and, according to his calculation, each poplar-tree yields not less than 40lb. of such material.

POPPY, or *Papaver*, L. a genus of plants comprising nine species, eight of which are indigenous: the following, of these, are the most remarkable:

1. The *Rhœas*, Red Poppy, Corn-rose, Cop-rose, or Headwark, grows in corn-fields, and flowers from June till August. The petals, when infused, yield a fine colour; and a syrup is prepared from such infusion, which partakes in some measure of the properties of opium, and is occasionally used in coughs, and catarrhal affections, on account of its anodyne effects.—These flower-leaves also yield, on expression, a bright-red juice, which imparts its colour to water, and the tint of which may be greatly improved by the addition of the vitriolic acid. Thus cloth, linen, and especially silk and cotton, were dyed of a beautiful deep-red shade.—The stuffs, previously immersed in a solution of bismuth, acquired a yellow cast; though Dambourney obtained only a pale nut-colour.

2. The *album*, v. *somniferum*, White or Wild Poppy, is found in neglected gardens and corn-fields, where it flowers in the month of June or July. The juice, which, after making incisions, exudes from the heads of this species, is suffered to inspissate by the heat of the sun, and thus affords the drug called Opium. An extract is also prepared from these seed-vessels; which, being less powerful than the foreign opium, is given in a double quantity, to produce similar effects. The seeds are very nourishing; are divested of the narcotic property of the flower; and yield on expression a mild, sweet oil, little inferior to that of almonds: hence, they are often employed as an article of diet. — Linnæus counted in one poppy-head 32,000 seeds; and as there are *white* and *blue* grains, we understand from an experienced gardener, that the former, when found in heads, the

capsule

capulse of which is of a blueish cast, are the most successful for propagating the species, and likewise afford a larger proportion of sweet-oil than the blue seed.

Poppies grow in almost every soil, but they flourish most luxuriantly in rich loamy ground, well manured with rotten dung, and frequently ploughed or turned, so as to render it mellow. The seeds may then be either drilled in rows about nine inches apart, or sown broad-cast, first towards the end of February, and a second time in March; though the latter process is sometimes followed, for winter-seed, in the month of September or October. As soon as the plants appear, they must be carefully weeded, by which means their growth will be promoted; so that each root will produce from four to ten heads, or pods, containing large variegated flowers. When the leaves begin to wither, it will be proper to extract the opium: for this purpose, four or five longitudinal incisions, about one inch in length, must be made on one side of the head, so as to cut through the outer or scarf-skin, without injuring the seeds. In consequence of such wound, a glutinous milky fluid will exude, which should not be removed till the succeeding day, when it ought to be scraped off into proper vessels; and, in the course of one or two days, the opium will be of a proper consistence to be formed into a mass. The opposite side must next be wounded in a similar manner, in order that the viscous juice may be completely extracted.

In the year 1796, the Society for the Encouragement of Arts, &c. granted the premium of fifty guineas to Mr. Ball; and also a similar reward to Mr. Jones; for their exertions in obtaining the largest quantity of *British Opium*. As their method was nearly similar to that above described, it is but justice to observe, that their preparations have received the sanction of several medical gentlemen, in whose opinion, the new produce is in all respects equal to the best Turkey opium.

3. The *Argemone*, Prickly, or Long Rough-headed Poppy, is an annual plant thriving in corn-fields; flowering in the months of June and July.—This weed much resembles the Red Poppy, and grows in similar places, though the former delights more in a sandy soil: hence it ought to be distinguished from the genuine plant, by its prickly seed-capsule, and the black points of its red flower-leaves.

POPPY, the Horned, or Celandine, *Chelidonium*, L. a genus of plants consisting of six species, four of which are natives of Britain; the most remarkable of these are the following:

1. The *majus*, Greater or Common Celandine, grows under hedges; in rough shady places; on rubbish, and uncultivated ground: it flowers from May till July.—The herb is of a blueish-green colour, the root of a deep red, and both contain a yellow juice: their smell is disagreeable, the taste somewhat bitter, very pungent or burning in the mouth; and the root is extremely acrid.

This juice, when diluted with milk, consumes white opaque spots upon the eyes, destroys warts, and cures the itch. Dr. Withering is of opinion, that a medicine of such activity will, at some future period, be converted to more important purposes.—Horses, cows, goats, and swine, refuse to eat this herb.

From the saffron-coloured juice of the Greater Celandine, no *permanent* colour could be obtained in the experiments made by continental dyers; but, according to the assertion of Rössig, a reputable German author, the whole plant produced, by fermentation, a good blue-colour, similar to that obtained from Woad, or the *Isatis tinctoria*, L.; a fact well deserving the attention of dyers.

2. The *corniculatum (Glaucium phœnicium* of Dr. Smith), Red Horned-Poppy, or Red Celandine, is found in corn-fields, in the county of Norfolk: its reddish flowers appear in the months of July and August.—This species is cultivated in gardens for the beauty of its flowers; but the whole plant is an acrid and narcotic poison.

PORCELAIN, or China-ware, a most refined, and almost vitrefied, species of earthen-ware, which is not only manufactured in China, but likewise in England, France, Holland, and Germany: the most esteemed and beautiful, both for its painting, and the taste displayed in shape and figure, is that imported from Meissen, in Upper Saxony.

As a detail of the manner in which porcelain is manufactured, would be foreign to our plan, we shall concisely relate the simple, but valuable, method of converting common green glass into porcelain, discovered by M. Reaumur. It consists in exposing such glass, surrounded with white sand, plaster of Paris, chalk, or gypsum, in a luted crucible, to a degree of heat equal to that of potters' furnaces, so as not to alter its form or shape. At first, it will assume various shades of blue; become gradually white; and, at length, no appearance of glass will remain. By this process, entire green bottles and other vessels may be converted into the finest china-ware.

Porcelain, if not properly annealed, is extremely brittle, and liable to crack: to prevent such accidents, it ought to be well boiled in pure water, before it is used; and, when cold, no hot fluid should be put into it, unless there be some sugar, or a tea-spoon in the vessel. Another method of obviating casualties, is that of holding china-vessels over steam, immediately before tea or coffee is poured into them. Such accidents, however, often deface the beauty, or otherwise diminish the value of a *set of china:* hence, it becomes a desirable object to join or cement the fragments, so as to be imperceptible to the naked eye. Under the article Cement, and likewise on other occasions (for which the reader is referred to the *General Index of Reference)*, we have stated the most proper expedients for this purpose: we shall therefore only remark, that all china-ware, imported by the East-India Company, pays 2l. per cent. on being deposited in their warehouses; and is subject to the farther prohibitory duty of 109l. 8s. 6d. per cent. according to its value, when taken out for domestic use.

PORK, is the flesh of hogs, killed for culinary purposes.

Having already, in the article Hog, treated of the relative salubrity of this aliment, when eaten in a fresh state; and likewise stated the best mode of preserving meat in general, under the heads of BEEF, FLESH-MEAT, and PICKLE; we shall at present only add the method formerly practised for *buccanning*, or pickling pork, by the famous Buccanneers of America. First, they cut the flesh into long pieces, about an inch and a half thick; and, after sprinkling it with salt, and suffering it to remain in that state for 24 hours, these slices were next dried in stoves till they acquired a bony hardness, and a deep brown colour.—Pork, treated in this manner, if packed in casks, may be preserved for upwards of a whole year; and, when soaked in luke-warm water, becomes plump, and has a rosy appearance. It likewise possesses a grateful flavour under the various forms of cookery, and is relished by the most delicate palate.

Beside the usual manner of curing pork with bay-salt, some housewives add juniper-berries, pepper, NITRE, and other antiseptic substances. The salt last mentioned, when used in small proportions, is peculiarly calculated to resist putrefaction.—See PICKLE, vol. iii. p. 374.

PORTER, a well-known malt-liquor, which differs from ale and beer, in consequence of its being brewed with malt that has been highly dried.

As porter constitutes the principal beverage of all ranks of people in this metropolis, particularly of the labouring classes; and as it is too frequently adulterated with deleterious drugs, and has lately been advanced in price; we think it useful to communicate the following recipe, together with the present prices of the ingredients (extracted from Mr. CHILD's late Treatise, entitled *Every Man his own Brewer*): according to which, every industrious family, where room and other conveniences favour the attempt, may prepare their own porter at a more reasonable rate than it is *now* sold, and without apprehending any adulteration.

	l.	*s.*	*d.*
One peck of malt - - - -	0	2	6
A quarter of a pound of liquorice-root -	0	0	2
Spanish juice - - - -	0	0	2
Essentia bina - - - -	0	0	2
Colour - - - - -	0	0	2
Half a pound of treacle - - -	0	0	3
A quarter of a pound of hops - - -	0	0	6
Capsicum and ginger - -	0	0	1
The expence of coals - - -	0	0	6
	0	4	6

These articles, when managed conformably to the directions given in the article BREWING, will produce *six gallons of good Porter*, which, at 1s. 6d. per gallon, would cost 9s.; so that one half of the expence is saved by making it at home.

The advantages thence arising are obvious; for, independently of its being a great object of economy, a more palatable liquor will result from the undertaking; and, being prepared in the house, it will afford additional pleasure, nay, often contribute to the prevention of a most detestable habit, that of *tippling in ale-houses*.—The proportions above stated are calculated only for small families, or such as cannot conveniently spare a room, or procure a proper apparatus for brewing: hence, by augmenting the ingredients, as circumstances may require, any quantity of pure and wholesome beer will be obtained.

For the information of those, who may be totally unacquainted with the process of brewing porter, we shall add a short explanation of the manner in which the *essentia bina* and the *colour* are prepared. In order to procure the first of these ingredients, a quarter of a pound of moist sugar should be boiled in an *iron* vessel, till it attain to the consistence of a thick, black syrup, which is remarkably bitter.—The colour is produced by boiling a similar quantity of moist sugar, till it acquire a taste between sweet and bitter: it imparts the fine mellow tint, that is so much admired in good porter. In preparing these two ingredients, however, it will be necessary to employ a small portion of pure, or of lime-water, "to bring it to a proper temper;" because they will otherwise grow hard and dry, if suffered to stand till they become cold. The essence and colour, are added to the first wort, with which they are boiled, and constitute the basis of porter.

This preparation forms an agreeable and salutary beverage to most constitutions; and, if it be *mild*, possesses gently laxative properties: —when *bottled*, and kept for some time, it acquires a high flavour, and is much esteemed, especially after having made a sea-voyage. A similar effect will result from sending such liquor to a considerable distance by land-carriage. The bottles ought to be carefully washed, and drained, till they become perfectly dry. After being filled with the liquor, they are suffered to stand for twenty-four hours, before they are corked, so that the porter may part with some portion of its fixed air, to prevent the bottles from cracking. At the end of that time, they should be closed with *sound* corks, which ought to be driven in, as closely as possible, and to a depth from 1½ to 2 inches, in order to exclude the air.

In regard to the relative salubrity of *Porter*, and other Malt-liquors, we have already expressed our opinion, in vol. i. pp. 241-2.

PORTLAND-POWDER, a particular compound, the recipe for which was imported from Switzerland, by an ancestor of the Duke of Portland. It consists of equal parts of Round Birthwort *(Aristolochia rotunda, L.)*; of Gentian; of the tops and leaves of Germander, Ground-Pine, and Centaury; dried, pulverized, and sifted. These are to be carefully incorporated; and one dram of the composition is to be taken every morning in a glass of wine and water, tea, or any warm liquid; after which the patient should fast an hour and a half. Such course is to be continued for three months without intermission; at the expiration of which, the dose must be reduced to one half, and taken as before, for the space of six months; when it is to be continued every second day, for twelve months longer.—This famous nostrum has long been held in high estimation, for its supposed efficacy in curing the *Gout*; and though, in the hands of judicious persons, it undoubtedly forms a powerful alterative; yet it must be classed among those quack-medicines, that by the length of time to which their operation is to be extended, cannot fail of doing frequent mischief.

POST, a stake, or piece of timber, which is fixed in the ground.

Posts are used both for the purposes of building, and of fencing; but, as the strength of the fabric, or of the fence, depends greatly on their nature or solidity, various expedients have been adopted, with a view *to season*, or prevent them from rotting. Among these, burning of the lower or subterraneous part, has been recommended as an excellent preservative; besmearing them with tar, pitch, &c. has likewise been found very serviceable; but the most effectual method is that employed in the county of Durham.—It consists in indenting, or puncturing the stake at right angles, to the heart or pith, by means of an instrument, somewhat resembling the *caulking-irons* of ship-carpenters; and which is furnished with one, two, or three rows of teeth. The wood ought previously to be well seasoned, warmed, and, lastly, coated with pitch or coal-tar; which will penetrate as far as its centre. By this operation, the strength and durability of timber will by no means be diminished; on the contrary, it will thus be better enabled to withstand the injuries of the weather.

POT-ASH, denotes an alkaline salt, or, with more propriety, a compound of different salts, obtained by reducing large quantities of wood to ashes: this process is termed, by chemists, *incineration*. The ashes are next boiled in water, so as to form a strong ley, which, after being strained, is evaporated in an iron vessel almost to dryness; the matter, which remains at the bottom, is then put into a crucible, liquefied over an intense heat, and poured out on iron plates, where it speedily cools, and assumes the form of solid pot-ash.

Such is the method generally practised in making this alkaline salt; but ingenious chemists have contrived various modes of preparing it, with a view to prevent the exportation of the large sums annually paid to Russia, America, Sweden, and other northern countries. Hence, we shall state only the method followed by Dr. PERCIVAL, for procuring pot-ash from the putrid water which runs from dung-hills; as being entitled to particular attention. His process is very simple: it consists in evaporating the fluid part, and in calcining the impure salt, till the foul or extraneous ingredients are almost entirely dissipated by the fire. From 24 wine-pipes of such liquor, Dr. P. obtained nine cwt. and 40lbs. of saleable pot-ash, which was valued at 2l. 2s. per cwt.; the expence of the whole process amounted to 4l. 9s. The salt, thus procured, has a greyish-white appearance; and is, when broken, of a hard, spongy texture: it is slightly affected by moist air; but, if it be kept in a dry apartment, near the fire, a powder is formed on its surface.—Lastly, this species of pot-ash contains, according to Dr. P.'s chemical analysis, such a proportion of pure alkali, as amounts to one-third part of its weight; while that imported from Russia, yields only one-eighth.

In the year 1796, a patent was granted to Mr. HOAKESLEY, for his method of making British pot-ash; for the supply of all manufactures, in which the foreign salt or any alkaline matter is useful. The ingredients employed, consist of English, Welch, Irish, or Scotch kelp; foreign barilla; and the salts obtained from soap-boilers' waste, whether by evaporation, or by calcination. The materials are pulverized, and thrown into a furnace of a peculiar construction, where they are, by intense heat, melted into a liquid, which is discharged through a channel into pots. When cold, the mass assumes the appearance of foreign pot-ash.

Barilla is said to furnish the best *pot-ash,* which is imported from Spain. It may also be advantageously prepared from kelp, salt, or glass-wort, fern, sea-wrack, and a variety of plants that are found both on the sea-coast, and in the interior parts of Britain.—This alkaline salt is employed in various manufactures, particularly in those of glass and soap; likewise by dyers, in the scouring of cloths, &c.:—it pays, on importation, the low duty of 2s. 5½d. per cwt.

POT-ASH-CAKE, a kind of biscuit, much used in the United States of America; and which is baked in the following manner:—Take two pounds of wheaten flour, and half a pound of butter: to these must be added half a pound of sugar, that has previously been combined with a pint of milk; and a large tea-spoonful of salt of tartar, crystals of soda, or any other pure pot-ash, which has likewise been dissolved in a small quantity of water. The whole is to be carefully mixed, and kneaded together: when properly rolled, it may be formed into cakes, which ought to be exposed to a brisk heat of an oven; as their lightness depends much on the expedition with which they are baked.

Pot-ash-cake is equally nutritious and wholesome: being speedily prepared, it deserves to be adopted, especially where yeast cannot be easily procured.

POTATOE, the COMMON, or *Solanum Tuberosum,* L. a valuable root, originally a native of America, whence it was introduced into Ireland; and subsequently into Britain, about the commencement of the 17th century.

There are numerous varieties of the potatoe, which are cultivated both for culinary purposes, and for the feeding of cattle. The most remarkable of these are: the Common Kidney; the Red American Kidney; the Aylesbury White; and the Altringham Early White; which are chiefly reared for the table; as the Ox-noble (for the most part in Nottinghamshire); Surinam; Irish Purple; Howard or Clustered; and Red Potatoes, are for fodder.

The common mode of planting potatoes is, by setting the small roots entire; or, by cutting the larger ones to pieces, and reserving one eye or bud to each: it appears, however, that the *rind* may be employed with equal advantage; as crops have thus been produced, which fully equalled those obtained from seeds, sets, shoots, or by any other method.

These plants will flourish in any tolerable soil; but they thrive most luxuriantly in light sandy loams, that are neither too moist nor too dry. Such lands ought to be deeply ploughed, two or three times; and, shortly before the ground is stirred for the last time in the spring, it will be necessary to spread a considerable quantity of rotten dung on the surface, which should be ploughed early in March, provided the weather be open; but, if it be frosty, this operation must be delayed till the end of that month, or the beginning of April. After the last ploughing, the ground ought to be levelled; the furrows drawn at the distance of three feet apart; and at the depth of about seven or eight inches. In the centre of this furrow are to be set the rind, eyes, cuttings, &c.; and then covered in with the earth. A short time before the young plants appear, it will be advisable to pass a harrow over the whole, in order to eradicate weeds, to break the clods, and to remove every obstacle to their vegetation.

Farther, as the potatoes increase, it will be proper to *mould*, or earth them up twice; a process, by which their growth will be greatly promoted. Mr. Turner's plough is eminently adapted to this purpose; but, having already described the implement under the article Plough, we refer the reader to p. 407, and foll. of the present volume, where the manner of employing it is concisely stated.

Beside the depredations of worms, grubs, and various other insects, to which potatoes are subject in common with other vegetables, there is a disease termed the *curl*, that peculiarly affects these roots; and for which ingenious agriculturists have endeavoured to account by various conjectures.—By some it is considered as a species of blight, but it is more generally attributed to one or more of the following causes:—1. Frost, either before, or after the sets, &c. have been planted. 2. The planting of such sets, from large or unripe potatoes. 3. From not placing them at a sufficient depth, or from putting them in exhausted lands. 4. By the first shoots of the sets having been broken off previously to planting; in consequence of which, the seminal plant is incapacitated from sending forth other shoots sufficiently vigorous to expand. 5. To a white grub, that preys upon the roots. 6. To the propagation of shoots, sets, eyes, &c. constantly from the same variety, and on the same land; so that the potatoes degenerate, and at length yield very indifferent crops.

In the 8th volume of the *Transactions of the Society for the Encouragement of Arts*, &c. we meet with an interesting communication on the *curl*, by Mr. W. Hollins, who divides the disease into three different stages, viz.

1. The *Half Curl*, in which the leaves of the plants are somewhat long, and slightly curled: they produce, however, tolerable crops, if the summer be not too dry; otherwise the potatoes will be small and watery.

2. The *Full Curl*: in this stage the plants seldom exceed the height of six or seven inches; speedily attain to maturity, and decay. The potatoes are, in general, less than a nutmeg; of a dusky-red colour; and are extremely unwholesome as an article of food.

3. *Corrupted Potatoes*, the vegetative power of which is almost destroyed, never appear above the surface of the ground. The seed will be found at Michaelmas in a state, apparently as fresh as when it was first set; a few small potatoes, perhaps, growing from the parent root.

This accurate observer attributes the curl first, to late setting in rich soil, succeeded by a hot, dry summer; in consequence of which, the flower of the plant falls off; the seed is exhausted in feeding the plant; and few potatoes appear. Should moist weather occur in autumn, the plants, after being earthed, will blow a second time, and a plentiful crop of potatoes will be produced. These are, in his opinion, perfectly wholesome as food; but, being generated from the stalk of the plant after the seed had been exhausted, their vegetative power is defective, and the plants that proceed from them, will necessarily be *curled.*

The second cause of this disease, Mr. Hollins attributes to the forcing of potatoes, by setting them in too rich a soil. His preventive method consists in *planting them early*, in ridges about one yard apart, having previously spread a little manure in the trench.—They are to be set in a triangular form, five or six inches distant, and covered with soil to an equal depth: thus they will be protected from the heat of the sun, in case the weather be too dry, while they remain sufficiently apart for receiving the full benefit of the air. When the plants have attained the height of six or seven inches, he directs them *not to be earthed up*, but to be occasionally weeded.—By this simple method, roots will be formed in due season, and grow gradually; and, as the stalk will decay at the proper time, the sap will be left in the potatoe, and *become a seed*, possessing a perfect power of vegetation; so that the plants raised from it will be wholly exempt from the *curl.*

There prevails another opinion respecting this disease, namely, that it is *contagious*; but such notion has been ably combated in the 2d vol. of *Communications to the Board of Agriculture*; where it is observed, that whatever tends to render a crop poor and weakly, is very apt to produce the curl: hence, the disease probably originates entirely, or in a great measure, from the following causes: 1. Land, altogether unfit for potatoes. 2. Imperfect culture. 3. Small roots; or too small a proportion of strong roots. 4. Sets, taken from roots that have sprouted early, and the germs of which have been rubbed off. 5. Too small, as well as too large a quantity of dung. 6. Too deep, or too shallow planting. 7. Every external impediment that may injure new plants. 8. Too stiff ground, or such as has been pressed down too closely on the sets. 9. An unfavourable state of the weather, while the crop is young.—The result of the writer's inquiries briefly is, that, if the curl be not a *disease*, but merely an *incidental debility*, it may be prevented by diligent attention to all those circumstances; which, according to experience, are essential to the prosperous cultivation of potatoes.

It is difficult to decide, amid this difference of opinion among *practical* agriculturists; but, as these roots materially contribute to the comfort of mankind, we have discussed the subject at some length; and shall now concisely state those remedies which have been successfully adopted. These are, steeping the sets for two hours, in a brine made of *Whitsters'* ashes; changing the seed, raising new kinds from the seed, or apple of the plant; or renewing the same sorts again

Fig. 1.

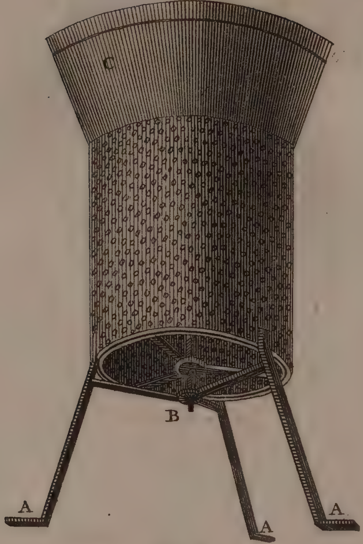


Fig. 2.

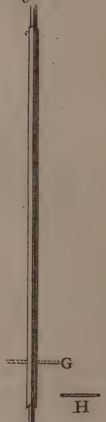
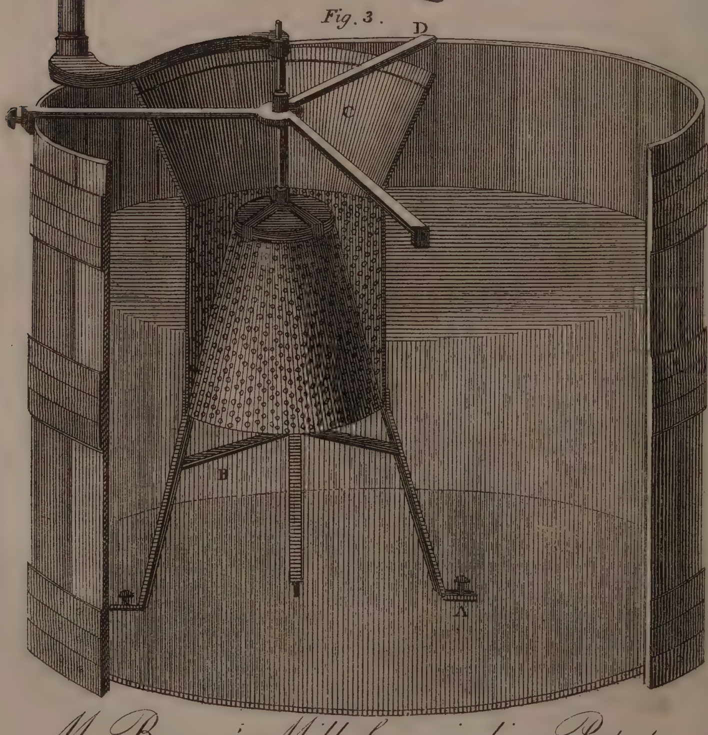


Fig. 3.



M. Baumé's Mill for grinding Potatoes.

again from the same seed: and, lastly, salt is said to be an excellent preventive against the depredations of the grub.

Beside the curl, potatoes are liable to two other disorders, viz. the *scab*, which consists of excrescences that arise in very dry seasons; and the *canker*, which is occasioned by small cavities, that appear in wet weather. These defects have been conjectured to be in some measure the cause of the curl; and they increase, according to the length of time the potatoes remain in the earth, after the roots have attained to maturity.

The proper time for digging up potatoes, is in the dry weather of autumn, when the leaves and stems begin to decay. If they are cultivated on a small scale, this work is performed by means of a three-pronged fork, furnished with flat tines: but, when raised in fields, the roots are turned up by a plough, the coulter of which is taken out, to prevent them from being cut. After those, which appear on the surface, are collected, a pair of drags is passed over the whole; in order to separate and expose such as may adhere to the clods.

The potatoe is one of the most valuable roots for culinary uses: when boiled, it forms a principal article of food, and serves partly as a substitute for bread. Mixed with wheaten flour, fermented with yeast, and properly baked, it makes a wholesome and nutritious loaf:—the most economical method of preparing these roots, we have already stated, vol. i. p. 330.

To render this Dictionary of Facts, as complete as its nature will admit, we shall here subjoin a description of a valuable machine: M. Baume's *Mill for grinding Potatoes*, of which we have given an engraving, from the Memoirs of the Academy of Sciences at Paris.

Fig. 1. Represents a grater made in a cylindrical shape, of plate-iron, which is about 7 inches in diameter, and 8 inches in height. The *burs*, formed by stamping the holes, are on the inside.

A, A, A, are three feet, made of flat iron bars, 7 inches in height, for supporting the grater, to which they are strongly rivetted. The bottom of each foot is bent horizontally, and furnished with a hole for the reception of a screw, delineated at A, Fig. 3.—At a little distance from the upper extremity of these feet, is fastened a cross piece, B, (Fig. 1 and 3), which is divided into three branches, and rivetted to them. This transverse piece not only serves to strengthen and keep such feet steady, but its centre being perforated with a hole, also supports an iron spindle (Fig. 2), the use of which will be presently described.

The upper part of this cylindrical grater is furnished with a diverging border of iron, marked with the letter C, (Fig. 1 and 3), and which is about 10 inches in diameter at the top, and 5 inches high. Farther, within such machine is fixed a second grater of a conical form (see Fig. 3); which is constructed of thick plate-iron, and fastened with the broad end at the bottom. The *burs* of the holes are on the outside: to the upper end of the cone, there is rivetted a small cross piece of iron, consisting of three branches; and in the middle of which a square hole is made for the reception of the spindle. This part of the cone is likewise strengthened with an iron cap rivetted to the grater, and perforated with a square hole, for the admission of the spindle.

Fig. 2. Represents such spindle, which is a square iron bar, about 16 inches in length, and somewhat more than half an inch in thickness. Both extremities, which are round, fit into the cross pieces B, (Fig. 1 and 3) and D, (Fig. 3), in the centre of which the spindle turns, and by means of which it is retained in its place. The upper end of such spindle ought farther to be square, in order that a handle (E, Fig. 3), may be affixed to it, which is about nine inches in length, and turns round the conical grater.

G, a small hole made through the spindle, in order to receive the pin H, that serves to keep the conical grater at a proper height within its cylindrical counterpart.

Fig. 3. Is a bird's-eye view, representing the mill placed within one end of an oval tub, resembling those employed for bathing. D, is the triangular iron cross abovementioned, which is screwed to the side of the tub; and in the centre there is a round hole, in which the spindle of the mill moves when at work. In this figure, part of the conical vessel is delineated as being cut off; in order that the internal structure of the machine may be more distinctly seen:—to prevent the bottom of the tub from being worn by the screws passing through the feet of the mill, a deal board about an inch in thickness, is placed beneath the latter.

In order to employ this machine, its feet must first be secured, as already described, and likewise the top, by means of the cross-piece D, (Fig. 3). The tub is next filled about two-thirds of the whole with water; and the top of the vessel with potatoes, that have previously been washed and sliced. The handle E, (Fig. 3), is then turned round, and the roots, after being ground between the two graters, are discharged gradually at the lower extremity; their egress being facilitated by the agitation produced in the water, in consequence of the operation of the mill.

When all the potatoes are ground, the pulp must be mixed up in a tub with a large quantity of pure water. A second vessel ought farther to be provided, on the brim of which two wooden rails should be fixed for the support of a hair-sieve: the liquid pulp is next to be poured through it; the flour, or starch, passing together with the fluid, and at length subsiding. In the course of five or six hours, the liquor may be poured off, and fresh water successively added (the pulp being occasionally stirred), till the fluid is discharged perfectly transparent.—When the flour is sufficiently washed, it must be taken out, placed on wicker-frames, and dried; care being taken to shelter it from the dust: as soon as all moisture is evaporated, it should be passed through a fine sieve, and preserved in glass vessels, *covered with paper.*

Such is the object of M. Baume's useful contrivance, which deserves general attention; for, if wheat should at any future time again rise to an exorbitant price, potatoes may thus be readily converted into wholesome and nutritious flour.

Independently of the essential use of these roots for culinary purposes, they afford excellent food for cattle. Thus, if half a pint of salt be added to every 300lbs. of potatoes, previously washed and steamed, together with a small portion of sulphur; this mixture, it is said, will support six horses per day with such effect, that the animals will be enabled to perform constant labour, without the allowance of either hay or oats. Farther, bullocks fatten more speedily on potatoes, than on cabbages or turnips, especially if a double portion of chopped hay or straw be mixed with the former. Cows also thrive well on these roots; so that with one bushel per day, together with a little hay, they will yield as large a quantity of sweet milk, or butter, as they usually produce, when fed on the finest grasses.

Potatoes are likewise serviceable in fattening sheep, and especially hogs; but, if the latter be designed for bacon or hams, it will be advisable to mix gradually four bushels of ground pease, with an equal quantity of the boiled roots; which portion *will*, it is affirmed, *fatten an animal of twelve stone.*—In a boiled state, they may also be given to poultry with similar effect.

Formerly, a kind of brandy was distilled from these roots; but the Legislature has wisely prohibited such practices. — Besides, a fine *size* may be prepared from potatoes, which will answer all the purposes of that in common use, particularly for whitening ceilings and walls. With this intention, any quantity of newly-made potatoe-starch should be boiled into a paste; a sufficient portion of which ought to be mixed with the whiting, after the latter has been diluted with water. The coat thus prepared is much clearer; retains its whiteness longer; and is less liable to crack or scale, than such as is mixed with animal glue.—There is another economical way of employing the water expressed from potatoes in the processes of making starch or size. This liquor is useful for washing linen, whether plain or coloured, silk handkerchiefs, stockings, &c. without the aid of any ley or soap: it is said to improve rather than to diminish the tint, while it restores their original brightness, and imparts a degree of stiffness to silk stuffs, which cannot be obtained by the common method of cleaning them. It deserves, however, to be remarked, that no discoloured or otherwise damaged roots must be used for this purpose.—Bakers in Germany, farther, convert the pulp of potatoes into *yeast*, by adding a small proportion (about the 8th or 10th part) of the latter, together with two drams of calcined and pulverized crab's-claws or oyster-shells, and a similar quantity of burnt hartshorn, to every pailful of the preparation. This compound is asserted to increase the bulk of the paste, and consequently of the bread; but double the measure of it is required to serve as a complete substitute for barm. — See also Cheese, vol. i. p. 501.

Farther, the stalks of these roots, when cut in small pieces, afford a grateful food to cattle: the haulm has also been converted into paper; but it is more generally, and, we conceive, more profitably, employed for stable-litter; or, when straw is scarce, instead of thatch for cottages.—Lastly, even the *potatoe-apples* may be usefully employed in domestic economy. In the *New Swedish Journal of Husbandry* for 1796, it is directed, that such apples should be collected while in a green and hard state; then well rinsed in cold water, and put for 48 hours into a strong filtrated brine. Next, they are to be placed for six or eight hours in a colander to drain, when they ought to be boiled in good vinegar, with the addition of some spice, till they acquire a certain degree of transparency, without becoming too soft. Thus prepared, they will afford a more palatable and less hurtful pickle than either olives or cucumbers.

Potatoes being of such extensive utility, various expedients have been contrived, with a view to preserve them. The most common method is, that of piling them up after they have become dry, in heaps resembling the roof of a barn; covering them closely with straw, in such a manner as to meet in a point at the top; and then slightly spreading them over with mould, which is beaten down with a spade. Some husbandmen make holes in the sides and top of the earth, in order that the air, arising from the natural heat of the roots, may evaporate; and, as soon as the steam ceases, the cavities are filled up, to prevent the effects of frost or rain. Another mode consists in depositing them in pits, and covering them with dry straw, or with the haulm of the roots; by which management, if their surface be perfectly dry at the time they are put in, potatoes may long be preserved in a sound state.

A continental writer of doubtful authority informs us, that such roots may be easily preserved from the effects of the severest frost, by placing a vessel filled with cold water immediately over them: the fluid should be in proportion to the quantity of the vegetables; and, if frozen, it ought to be removed every morning and evening; when a new supply must be instantly procured.—The same author observes, that *frost-bitten* potatoes may be rendered equally, nay, more useful than those in a fresh state. This paradoxical proposition he supports by the following directions:—Select all the roots thus injured; place them in a dry and warm place till the frost be expelled; then remove the peels, cut them in slices, and place them on wicker frames till they are perfectly dry. Thus they acquire a dark hue, lose three-fourths of their bulk, and retain only the inspissated sap, which becomes very hard and incorruptible, so that it may advantageouly be used on long voyages. When reduced to powder, and boiled with broth, milk, or water, with the addition of vinegar and a few aromatic herbs, those frozen fruits are said to afford a very palatable and nutritive food.

From the 2d vol. of the *Reports of the Society for increasing the Comforts, &c. of the Poor,* we shall extract an interesting paper on the preservation of potatoes, by Mr. MILLINGTON.—According to his statement, three pounds of potatoes were peeled, rasped, and put in a coarse cloth between two boards, in a napkin-press, till they were compressed into a very thin cake, that was placed on a shelf to dry. The roots yielded, on expression, about one quart of juice; which, being mixed with an equal quantity of cold water, deposited in the course of an hour, upwards of one dram of white flour or starch, in every respect fit for making fine pastry.—Mr. M. presented in 1799 to the above-mentioned Society, a cake, which had been thus prepared in the year 1797. In bulk, it occupied only one-sixth part of the original roots; and lost about two-thirds in weight by the process;

but he observes, that such cake, when dressed by steam, or otherwise, will afford nearly the same quantity and weight, as three pounds and a half of potatoes, properly boiled.—Some roots, that had been thoroughly frozen, have been managed in a similar manner; and the cake was perfectly sweet; whereas others of the same parcel, that were left unpressed, in a few days became rotten.

Mr. MILLINGTON's second method of preserving these roots, is as follows: Five pounds of potatoes were properly cleaned and pounded in a mortar, *without being previously peeled*; and then pressed in a small wine-press into a thick cake; the whole being completed in the manner above described. This cake also was sweet and wholesome, but did not possess the clear whiteness of the former; nor does it appear that such as were prepared according to the last process, will remain sweet for the same length of time as those consisting of *peeled* potatoes.—At all events, this contrivance deserves to be farther pursued and improved; for, independently of the immediate advantages that will result from supplying mariners with vegetables, it is an object of the greatest importance, when considered as a mean of preserving so useful, though perishable, an article for years; and of laying up a store in plentiful seasons, against the time of scarcity.

Another mode of keeping potatoes, was lately and successfully tried, by the patriotic Bath and West of England Society; and which certainly is less complex than that before described. It consists simply in slicing potatoes, without taking off the rind or skin, and afterwards drying them in an oven or kiln. The roots thus prepared will remain sweet for almost any length of time: the Society sent some to Jamaica in a barrel; which had been *four years* from Britain, and, on their return, were found not to be in the least degree affected.

POULTICE, an external application employed for promoting the suppuration of tumors, or abating painful inflammation; and which is sometimes also called a *Cataplasm*.

Poultices are generally prepared of bread and milk, to which are added oil, lard, or other unctuous matter, to prevent their adhesion to the parts inflamed. In large hospitals, the consumption of these articles for such purpose being very considerable, while the bread and milk are liable to become sour in warm weather, the following ingredients have, by Mr. T. PAYNE, surgeon, been proposed as substitutes:—Take, of the finest pollard, three parts; of genuine linseed flour, one part; both by measure; and, of boiling water, four parts: mix these ingredients with a spoon or a broad knife; and they will, in general, form a poultice of a proper consistence, without requiring oil, lard, or other emollient ointment: though, if the inflammation be considerable, a small quantity of oil may be added, to prevent adhesion.

POULTRY, a term including every kind of domestic fowls which are reared about yards, such as cocks, hens, ducks, turkeys, &c.

Poultry constitutes part of every farmers stock, but the rearing of it is, in this country, seldom productive of any pecuniary advantage; for, though fowls are considered chiefly as an article of luxury, and sold at high prices in the market, they never repay the value of the corn which they have consumed, especially if such grain must be purchased. With respect to farmers, we are aware, that the profits arising from the stock of the poultry-yard, are claimed by custom as the *market-money* of every housewife. Nevertheless, we conceive, it would be more conducive to their mutual interest, if this *expensive* perquisite were compensated by an annual allowance of *pin-money*. Indeed, where profit is the object of the husbandman's labours, no poultry should be admitted into the vicinity of *barns*; unless for the purpose of picking up scattered grain: though, in general, it cannot be denied, that they acquire their fat substance from the corn left in the straw, by negligent threshing.—For the most economical methods of rearing fowl, the reader will consult the articles COCK, HEN, DUCK, GOOSE, TURKEY, &c.—See also CHAFER: vol. i. p. 486.

POUND. See WEIGHT.

POWDER, a form of medicine, which is prepared, by breaking and reducing sustances to minute particles, either in a mortar, or by chemical process.

In the preparation of powders, especial care ought to be taken that no corrupted, or impure matters be employed. Dry aromatic substances should be sprinkled, during their pulverization, with a few drops of water; while those of a moist nature, may previously be exposed to a moderate heat. Gums, and other materials that are with difficulty reduced to powder, may be mixed with drier articles, and no part should be separated for use, till the whole quantity has passed through the sieve, and the different siftings are incorporated.

If powders be long kept, and the air not carefully secluded, their virtue becomes greatly impaired. Thus, ipecacuanha, if exposed to the action of the atmosphere, at length loses its emetic property.

The dose of powders, in general, is from one scruple to a dram; though the principal ingredient often does not exceed one grain.—The usual vehicle for taking this form of medicine, is any agreeable thin liquid, or pure water; but the more ponderous calces of metals, as well as the powders compounded of resinous matters, are more eligibly swallowed in syrups, or other thick liquor.—On the whole, medicines reduced to this impalpable state, operate both more certainly and expeditiously than pills, lozenges, or bolusses; without clogging the stomach and bowels.

PREGNANCY, a certain state of the animal body, which requires no farther explanation.

The first duty of persons, in that prosperous condition is, a constant and redoubled attention to all the surrounding and occasional causes which may be productive of injurious effects on their constitution. Thus, prudent mothers will greatly contribute to the future health and welfare of their children, by avoiding every violent and depressing passion; living regularly in all respects; and especially by taking proper or moderate exercise in the open air. These few hints cannot with too great earnestness be impressed on the female mind; as every comfort, or misery, connected with family life, will, in a great measure, depend on the conduct pursued during that important crisis. Hence persons, thus situated, ought to be extremely vigilant over the vagrant effusions of fancy, and not suffer themselves to be misled by the frequent, though momentary, impulse of an excited imagination: the happy consequences of such a system would be felt by future generations; because every neglect, of which they are guilty at this period, cannot fail to be productive of physical and moral detriment to those who are the dearest pledges of their existence. Nor should they indulge, beyond the bounds of reason, in the eating of any strange dish, or drinking particular liquors, to which they are not accustomed; as desires of this nature must be ascribed to an *unnatural appetite.*

It is an indisputable truth, that in the present improving state of society, we possess no distinct treatise on a subject of the highest importance to the prosperity of mankind; namely, a popular work on *pregnancy*, in which scientific rules are delivered with such a degree of delicacy as to convey plain instructions, in a correct and pleasing manner. Until this great desideratum be fulfilled, we are inclined to repeat the just complaints of SOCRATES against his cotemporaries, that they cultivated the art of rearing good horses, but neglected that of educating their children.

PRESERVATION, in domestic economy, is the art of preserving animal and vegetable substances, with the least trouble and expence.

In the articles BACON, BEEF, BUTTER, CHEESE, FLESH-MEAT, PICKLE, &c. we have already pointed out various new and effectual contrivances for preventing the corruption of *animal* food: and though we likewise treat, in the progress of the alphabet, on the most useful vegetable bodies, and introduce the best methods of preserving them in a fresh state, yet we cannot neglect this opportunity of communicating to our readers a *general fact* of the utmost importance to the maritime interest of this country; and which appears to have hitherto escaped the notice of British journalists.

As we never attribute the merit of a *new discovery* to any person but the original inventor (let him be a *sworn patentee* or a mere adventurer), we shall begin our narrative with the name of a philanthropic Livonian clergyman, Mr. EISEN, who, in the year 1772, published a few sheets in the German language, of which the following is the substance:—After numberless experiments made with a view to ascertain the relative moisture contained in different plants, this excellent man has clearly convinced the world, by actual proofs laid before the late FREDERIC the Great of Prussia, that "vegetables may be preserved in their natural state, so as to retain their juices, their colour, taste, and alimentary properties, for a series of years, by a proper method of drying and packing them."—As we propose to describe this simple process, under the article VEGETABLES, let it suffice to observe, that eight tons, or 32,000 pounds of fresh herbs and roots, may thus be concentrated into the compass of 16 cwt. or the twentieth part of their bulk, so that a single horse may remove with ease, what otherwise would have required the united efforts of twenty.

PRICK-TIMBER. See SPINDLE-TREE.

PRICK-WOOD. See Wild CORNEL-TREE.

Prim. See Privet.

PRIMROSE, or *Primula*, L. a genus of plants comprising 19 species; four of which are indigenous: the following are the principal:

1. The *vulgaris*, or Common Primrose, is perennial, grows in woods, hedges, thickets, and on heaths; it flowers in the months of April and May.—The blossoms of this species form an ingredient in pectoral teas; and the young leaves may be eaten in the spring among other culinary herbs.—Bees visit the odoriferous flowers, which are also said to impart briskness to wines. The roots, immersed in a cask of beer, or ale, render it much stronger.—Linnæus asserts, that silk-worms may be fed with its leaves.—Sheep and goats eat this plant; but cows do not relish it, and it is wholly refused by horses and hogs

2. The *veris*. See Cowslip.

3. The Polyanthus, a beautiful exotic species, which is cultivated in gardens, on account of its fragrance. It is one of the earliest spring flowers, and numerous varieties have been raised by gardeners; some of which are so greatly admired, as to be sold at *one guinea* per root. These are propagated from seed, which ought to be sown in December, in boxes of light rich earth, and slightly covered. When the young plants appear, they must be sheltered from the heat of the meridian sun; and, if the spring be dry, it will be requisite to water, and keep them in the shade.—In the month of May, they may be removed into rich shady borders, that have previously been manured with neats'-dung, where they are to be set at the distance of four inches, till they have taken root. Here they must be carefully weeded; and, towards the end of August, they should be finally transplanted into borders of rich, light earth, in rows of six inches apart, and occasionally watered. At an early period of the succeeding spring, the plants will flower; and, if intended to be preserved, it will be necessary to remove them, when their time of blowing is past, into another border of similar soil; where, being weeded, and sheltered during the winter, they will produce strong and beautiful flowers in the following spring.

PRINT, an impression taken from a copper-plate.

As prints are more durable than paintings, and form a valuable part of the furniture of almost every house, we shall subjoin a method of cleaning and bleaching them, in case they become stained by accident, or otherwise soiled. It was invented by Signior Fabbroni, an Italian chemist, who published it in Brugnatelli's *Annali di Chimica*.—He directs a strong glass bottle to be half-filled with a mixture of one-fourth part of red lead, and three-fourths of spirit of salt, and to be closely secured by a glass stopper. The vessel is then to stand in a cool shady place, till a certain degree of heat, which is spontaneously produced, indicates the forming of new combinations. The *minium* loses a considerable portion of its oxygen, which unites with the liquor, and communicates to it a rich gold colour, together with the smell of oxygenated muriatic-acid (bleaching liquor); and a small quantity of lead is held in solution, which does not, however, lessen its effects.

In order to employ the liquid, thus prepared, a border of white wax should first be formed, about two inches in height, upon a large pane of glass: on this, the prints must be laid, in a ley made either of fresh urine, or of water mixed with a little ox-gall, for the space of three or four days; at the expiration of which time the liquor must be supplied with warm water, that ought to be changed every third or fourth hour, till it is poured off perfectly clear. Should any resinous matter remain on the prints, they must be moistened with a little alkohol.

The moisture must next be drained; and the print, being again placed on the plate of glass, ought to be covered with the oxygenated muriatic-acid liquor. Another pane is then to be placed on the lower one, to prevent any dangerous consequences arising from the pernicious vapour of the acid. In the course of one or two hours, the most discoloured prints will be restored to their original beauty. Lastly, after pouring off the acids, the prints must be washed two or three times in pure water, and dried in the sun.

PRINTING, the art of taking impressions from figures or characters, on paper, linen, silk, &c.—It is divided into three distinct branches; namely, 1. From copper-plates, for pictures, which is denominated *rolling-press printing*. 2. From blocks, on which birds, flowers, and other representations are cut, for printing linen, cotton, or similar articles; and which is known under the name of *calico-printing*. 3. From moveable letters, for multiplying books, and which has received the appellation of *letter-press printing*.

The branch last mentioned, is undoubtedly the most curious and valuable; as to its general dissemination, may be chiefly attributed the progress of learning; the numberless discoveries and improvements in the arts and sciences, together with a variety of other valuable contrivances in domestic life, that must otherwise have been confined to the knowledge of a few individuals, if not totally lost to mankind. Hence, several cities have contended for the honour of its first introduction; but the claim is confined principally to Haarlem, in Holland (where it was invented by LAURENCE COSTER), and to Mentz, in Germany (where FAUST and GUTTENBERG were the first printers): to each of these it may in some measure be ascribed; the printing with *separate wooden types* being first practised at Haarlem in 1430; as that with metal types (which were first cut, and afterwards cast) was discovered at Mentz, in the year 1444 or 1445.

From Holland, the art of printing was introduced into England, about the middle of the 15th century: it was first carried on at Oxford; whence it has been diffused to every quarter of the island, and is now brought near to its acme of perfection.—A more minute account of the history of this valuable art, will be found in Mr. AMES's *History of Printing* (3 vols. 4to. 3l. 13s. 6d. 2d edit.); and in Messrs. BOWYER's and NICHOLS's *Origin of Printing* (8vo. 2d edit. 5s. boards).

In the year 1795, the Society for the Encouragement of Arts, &c. conferred a bounty of forty guineas on Mr. RIDLEY, for his invention of a *Printing-press*, on a new construction; but, as a description of its mechanism would be intelligible only to printers, the reader is referred

ferred to the 13th vol. of the Society's "*Transactions*;" where it is accurately described, and illustrated with an engraving,

PRIVET, PRIM, or PRINT; *Ligustrum vulgare*, L.; an indigenous shrub, growing on rocks in the most exposed situations towards the Western Sea, and flowering in the months of June and July.

The Privet may be easily propagated by seed, layers, or by cuttings: being a hardy plant of quick growth, it is usefully employed in making hedges. It attains the height of from ten to fifteen feet; is adorned with oblong leaves, and bears black berries containing a violet pulp, which ripens in October. Its juice, when mixed with a solution of any acid salt, affords a black; with Glauber's salt, and spirit of sal ammoniac, a red; with urine, a purplish; and, with vitriol of iron, a green colour.—On steeping these berries in a solution of salt of tartar, they yield a fine blue juice, the shade of which may be rendered still brighter by adding quick-lime.—WEISSMANN, the author of the "*Franconian Collections*" (in German, vol. i. p.312), conjectures that the incomparably *black ink* of TRAGUS, was prepared from these berries, combined with oil of vitriol.—With the addition of alum, this fruit is said to impart to wool and silk a good and durable green colour; but, for this purpose, the berries should be gathered as soon as they are ripe. The purple colour upon cards is likewise prepared from their juice.—The kernels contained in these berries, produce by expression an excellent oil. The wood serves both as fuel, and for the smaller objects of turnery, but especially for pegs, as it is uncommonly firm.—The branches of this shrub are useful for wicker-work, as well as for the finer kinds of baskets, on account of their great flexibility.—As this shrub is much frequented by the Spanish fly, we conceive it might with advantage be cultivated in the southern counties of Britain, for the purpose of collecting that valuable insect.—Oxen, goats, and sheep, eat the plant; but it is refused by horses.

PRONG-HOE, an implement of husbandry, employed for the hoeing or breaking of ground near, or among the roots of plants. It consists of two hooked points, six or seven inches in length; and, when stricken into the ground, will stir, and turn it to the same depth as a plough; thus answering both intentions, that of opening the land, and of cutting up weeds.—The prong-hoe is a very useful instrument, especially in the horse-hoeing husbandry, when the hoe-plough can only come within two or three inches of the rows of vegetables; as the land may thus be raised and stirred to the very stalk of the plant.

PRONUNCIATION, a term denoting the manner of articulating or sounding the words of a language.

Pronunciation is the most difficult, and at the same time the most defective part in grammar, the writer having frequently no determinate expression, by which he can convey a distinct idea of particular sounds: hence it becomes necessary to substitute a precarious and even vicious term. These remarks are peculiarly applicable to the English language, where the same word is often both a noun and a verb; for instance, "to present a nosegay; and, to accept of the present:" the real difference being distinguished only by the accent.—To remedy such inconveniencies, it has been proposed to establish a standard of pronunciation, by means of certain visible marks; and different essays have been published on the subject. The best work of this nature, as a guide to young persons, and more especially to foreigners, appears to be, Mr. JOHN WALKER's *Pronouncing Dictionary* (4to. 2d edit. 1l. 5s.); by a diligent study of which, the reader may be enabled to form his pronunciation in the most appropriate manner. The author of this classical book, being a gentleman of considerable literary attainments, possesses the additional merit of a teacher, who, through a long series of years, has formed many of our best public speakers: nay, we are convinced, that the happy talent of imparting judicious precepts with a melodious, distinct, and manly enunciation, has seldom been more conspicuous in one person.

PROPAGATION, in general, signifies the act of multiplying the kind or species; but, in this place, we propose to treat only of *vegetable* nature.

Beside the usual modes adopted by gardeners and agriculturists, of propagating trees, shrubs, &c. there are *two* other methods of multiplying plants, in a manner equally novel and surprizing.

1. *Planting the leaves*, was accidentally discovered by J. F. HENRY, a German, who died at Augsburg in 1726. He reared many large trees, by setting healthy leaves in flower-pots containing sifted garden-mould, so that one-third of the leaf was covered with earth. Over these pots, he suspended vessels filled with water, which gradually dropped upon the small plantation beneath: thus, the young stems began to strike root and grow like those reared from kernels.—HENRY was born at Stuttgard, in 1647, where at an early period of his life he made this useful discovery, which was first described by MANDIROLA, an Italian monk, who published a treatise "*On Flower-gardens and Orangeries*," in 1679.

2. *By covering horizontal sprigs, or branches with moss.*—This ingenious method of multiplying plants was lately announced by J. C. WENDLAND, an eminent gardener in Germany, who described it for the benefit of the public, nearly in the following words:—Such shrubs as cannot conveniently be propagated by seeds, sets, or by layers, may be easily multiplied, especially if they have young branches near their roots. For this purpose, the earth around the stem ought to be previously loosened, elevated, and made nearly level with the lowermost sprouts: these should next be laid on the ground horizontally (without cutting or breaking them); then fastened with small wooden hooks; covered with moss; and frequently watered, so that the latter may closely attach itself round the branches. The operation may be performed either in the spring, or autumn: if in the former season, the moss should never be suffered to become dry; if in the latter, it must be covered with straw, to protect the layers from the effects of frost. When the moisture has softened the rind of the sprouts, young roots will strike through the moss into the soil, and numerous plants may thus be obtained in the course of one summer, sufficiently vigorous to be removed to the nursery,

sery. No biennial parent-branches, however, need be employed; as these will produce new saplings only in the second year.

PROVISIONS. See FOOD; FLESH-MEAT; and VEGETABLES.

PRUNES. See p. 413. Article PLUM-TREE.

PRUNING, in gardening and the culture of forests, denotes the lopping off exuberant or diseased branches, with a view to render trees more fruitful; to make them grow higher, and with greater regularity; or to produce larger and better-tasted fruit.

The greatest care is requisite in the management of wall-fruit-trees, especially during the spring, when their growth is most rapid: all superfluous branches must be closely cut off with a sharp bill, in order that the wound may speedily heal. Those, however, which are intended to bear fruit in the succeeding year, ought on no account to be shortened during their growth; for such operation would cause two lateral shoots to spring from the eyes beneath the part where they were cut off; and the course of the sap would be diverted: hence it becomes necessary to remove these shoots; as they will otherwise prove highly detrimental to the tree.

Farther, Mr. BUCKNALL directs all useless buds to be *rubbed off*, immediately after they appear, and not to be extirpated by the knife; because new buds will shoot forth with increased vigour: others must be *pinched*, where new shoots are required to supply the vacancies of the wall. By this treatment, fruit-trees may be so managed, as to render the operation of pruning unnecessary during the winter.

With respect to *standards*, it will be advisable to shorten their branches only, where they are either too luxuriant, or, by growing irregularly, divert the current of the sap, and consequently weaken the whole. In such case, the more vigorous sprouts ought to be closely cut down, in order to strengthen the other parts: but these amputations should not be performed on stone-fruit trees; which are very liable to become affected with the GUM, and thus, in a short time, to perish. It will, therefore, be necessary in the latter instance, to pinch the straggling shoots early in the spring.—But all decaying or apparently dead branches, whether belonging to wall, or other fruit-trees, ought to be pruned closely to the stem; because, by attracting noxious particles from the air, and admitting too great a degree of moisture into the tree, such useless parts contaminate the *balsamic virtues* of the sap, and thus eventually cause the destruction of the tree, by affording a nest in which insects will deposit their eggs.—Lastly, all branches that intersect each other, and thus occasion a confusion in the crown of the tree, ought likewise to be carefully removed; and, as vigorous young shoots often spring from old arms near the trunk, and grow up into the head, they must be annually exterminated; lest they should fill the tree with too much wood.

In regard to the proper period for commencing this operation on fruit-trees, especially in orchards, Mr. BUCKNALL is of opinion, that pruning should be first practised in the nursery, and regularly continued to the "extremity of old age." Thus, it will be advisable to take off only a small quantity of wood at one time; and, by employing his *medication* (See CANKER), the wounds will heal without causing any more blemishes in the tree than those to which it was subject, at the time when the branch was separated. If such tree, however, be very old, and much incumbered with useless wood, it will be proper to cut off all decayed, rotten, or blighted branches, previously to the operation; and to rub them with the preparation above alluded to, with a view to exclude the cold winds:—lastly, Mr. B. observes, that the rest may be left "to the discretion of each person, who will soon see how much is necessary; self-conviction being the best school for improvement."

If *forest-trees* have attained a large size, it will be most advisable not to prune them, unless it be absolutely requisite; and, even in such case, very few large branches ought to be taken off. Small shoots must be lopped closely, smoothly, and in an oblique direction; but extensive arms should be cut off at the distance of three or four inches from the stem. The branches of crooked trees must be separated at the curve, sloping upwards; and one of the most vigorous branches trained, for the purpose of raising a new stem: if, on the contrary, the tree be *top-heavy*, it will be necessary to *thin* the boughs that proceed from the main branches.—And, if the former continue to grow out of the sides, and the top be unable to support its own weight, such boughs as have appeared in the spring, ought to be closely pruned immediately after Midsummer.

PUDDING, a well-known dish, frequently found at the tables of our English readers.

The most wholesome dishes of this nature, are doubtless those made of bread, milk, and eggs, and which are known under the name of *bread-puddings*. Next to these, are such as are prepared by mixing a small proportion of suet, or other animal fat, with flour, eggs, and milk. The whole must be carefully incorporated, and boiled three hours or longer, according to its size, before it is carried to the table.

A palatable dish may be obtained, by boiling half a pound of potatoes till they become soft, when they must be mashed, and rubbed through a sieve. Half a pound of melted fresh butter is then to be combined with a similar quantity of sugar; and all the ingredients are to be mixed up with six eggs, and a little brandy. The whole is now to be poured into a cloth, and boiled for half an hour, when it may be served with some melted butter, sweetened with sugar; to which a small portion of wine may be added.

The cheapest preparations of this nature, however, are *rice-puddings*:—let a quarter of a pound of rice, and double that quantity of raisins, be tied loosely in a cloth, and boiled for two hours; at the expiration of which time, it may be put in a dish, and carried to the table. Or, the rice may be boiled in a cloth for one hour, when a quarter of a pound of butter is to be stirred in, and the pudding sweetened to the taste: it should then be boiled for another hour, after which it will be fit for immediate use.

PUFF-BALL, or *Lycoperdon*, L. a genus of fungous plants, consisting of many species, 25 of which are indigenous: the principal part of these are the following:

1. The *equinum*, or Equestrian Puff-ball, growing on the horns of cattle and sheep, but more commonly on the hoofs of horses which have been long exposed to, and softened by, the weather.—This plant is brownish-white; its stem is solid and cylindrical; the head globular, but rather concave below:—it is sometimes used as a styptic.

2. The *proteus*, Common Puff-ball; Bunt; Frog-cheese; or Puckefist; growing in pastures, and on road-sides; flowering in the month of August.—When burnt, it emits narcotic fumes, on which account it is occasionally employed to *take a hive*, without destroying the bees.—This species, as well as the Orange-coloured Puff-ball *(Lycoperdon aurantiacum)* is sometimes used as a styptic.

All these plants, while young, are of a roundish figure, and possess a soft fleshy substance, similar to that of mushrooms; but, when attaining to maturity, they become hollow, and are filled with an extremely subtle powder, that is very destructive to the eyes; cases having occurred of persons, who were, by coming in contact with it, deprived of their sight for a considerable time, and also affected with violent pain, and inflammation.

PULMONARY CONSUMPTION, or *Phthisis pulmonalis*, a wasting of the lungs, attended with fever, cough, and expectoration of matter: it is one of the most fatal disorders to which mankind is subject, and therefore requires our most serious attention; as it frequently originates from the most trivial causes.

Persons, who possess what is termed a *natural disposition* for this malady, generally have a flat, compressed, or otherwise deformed chest; a long, thin neck; the shoulders sharp-pointed; the teeth are uncommonly white, and not subject to decay.—Two periods in life are said to be particularly obnoxious to phthisis; namely, the first, from the eighteenth to the twenty-fifth; and the second, between the thirty-third and thirty-eighth year. It has farther been observed, that men are more liable to it than females, and that it occurs less frequently in the West Indies than in Europe.

The following are the principal symptoms which indicate this malady: after a previous complaint in the chest, pains are felt under the breast-bone; shivering, succeeded by heat; the voice becomes shrill; a cough ensues, that gradually increases, particularly on lying down, so as to interrupt the rest; the patient finds himself most at ease on the diseased side. The expectoration at first generally resembles mucus, but afterwards becomes frothy matter streaked with blood: the pulse is rather feverish. Such is the *first*, or *inflammatory stage*.

If these symptoms are not timely relieved, they become extremely aggravated; the expectorated matter assumes a yellow, green, and brown colour; and is particularly offensive in the morning; the cough and pains increase; the symptoms of Hectic Fever (which see), appear regularly twice a day; the palms of the hands burn after taking meals; the cheeks are of a glowing red; the body and strength decline. Such are the characteristic signs of the *second*, or *suppurative period*.

In the *third*, or *last stage*, all these symptoms are more violent; the bones project in every part of the body; the temples appear hollow;

low; the face presents a very unhealthy appearance; the eyes sink deep within their sockets; the nose becomes pointed; the hair falls off; and the nails curve inwardly. Night-sweats, particularly about the head and chest, together with debilitating offensive loosenesses, now make their appearance. The hands and feet swell; the speech is progressively weakened, till death closes the scene, in most cases, with a gentle fainting. One circumstance is remarkable, that the unhappy sufferer, even at the summit of the disease, always flatters himself with hopes of recovery.

Causes;—Whatever may affect the organs of respiration, in such a manner as to produce inflammation, for instance, arsenical and other noxious fumes; the injudicious treatment of catarrhs, and other complaints of the chest; the improper use of astringents, &c.; after blood-spitting, foreign substances fall into the windpipe (whence stone-masons, miners, hair-dressers, and grinders, are frequent victims to this fatal disease); suppression of habitual evacuations; inordinate passions; sudden change from heat to cold. It has often been questioned, whether consumption be hereditary or contagious; but a superficial observation of the ravages in certain families, would soon resolve any doubt on these points.

The danger attending pulmonary consumption, is such as to leave little or no hope of recovering after the *second* stage has once commenced: where it proceeds from an hereditary disposition, it proves incurable. If it originate from suppressed evacuations of blood, or the repulsion of cutaneous eruptions, we may, by a judicious treatment, still flatter ourselves with a favourable issue. The duration of the disease varies according to the difference of constitution, cause and treatment, so that it may extend to twelve months, and even two or three years.

The *Cure* must be adapted to the cause, stage of the disease, and difference of the season; but the following may be admitted as *general* rules: All irritants and astringents (such as acids, &c.) ought to be avoided, and emollient medicines administered; the diet must be chiefly, and during the fever entirely, of the vegetable kind, light and nourishing. The utmost temperance is necessary, not to stimulate the blood, and thus increase the hectic fever.—Blisters applied to the back and sides, and other topical applications for deriving the fluids, are highly beneficial in the first stage, but less so in the sequel. All irritating remedies are to be avoided in the inflammatory stage, such as bark, the heating gums, &c.; on the contrary, recourse should be had to gentle evacuations, particularly by small doses of ipecacuanha, so as to produce long-continued nausea. If the inflammation subside, some gentle solvents, such as sal-ammoniac, the Iceland Liverwort (p. 117), with sea air and a voyage, will be found eminently serviceable; though the latter cannot be supposed to act otherwise than as an emetic: it ought however to be performed in the warm season. Gentle pedestrian exercise is preferable to that on horseback; the latter requiring too great an exertion; but, in cases of extreme weakness, a carriage will be preferable. Should these modes of exerercise be found inadmissible, recourse may be had to *swinging*, with benefit to the patient. It is likewise necessary that the atmosphere be mild and pure; hence physicians have been induced to adopt a variety of expedients to answer this purpose. Dr. BERGIUS, in Sweden, and his followers in France and Britain, recommend a residence in a *cow-house*, which has uniformly relieved the patient, particularly during the cold seasons. The inhalation of factitious airs, which of late years has acquired some celebrity, can prove of advantage only in the first and second stages.

From a retrospect of the whole, it is evident, that we can flatter ourselves but with small hopes of recovery, after this melancholy disease is once confirmed in the constitution: and how futile are all the various specifics, and other remedies, the bane and disgrace to mankind! The principal point will consequently always remain, to avoid all those causes, that may affect the lungs, and which we have already specified under the heads of CATARRH, and COUGH.

PULSE, in animal economy, a term denoting the alternate dilatation and contraction of the heart and arteries, in consequence of which the blood, being ejected from the left ventricle of that organ, is impelled into the arteries, so that it may circulate throughout the body:—this incessant motion, or throbbing of the vessels, is distinctly perceptible by the finger.

The various circumstances by which a *natural pulse* is liable to be affected, are, by Dr. FALCONER, classed under the following heads: 1. Such as arise from bodily organization, namely, sex, temperament, and stature; 2. Such as proceed from the difference in the time of life; 3. Time of day; 4. State of the system respecting rest or activity, viz. sleep, exercise, and mental agitation; 5. State of the body with regard to temperature; 6. Effects of food and abstinence:—to these may be added the season of the year, the greater or less pressure of the atmosphere, and a variety of other circumstances, too numerous to be detailed. Thus, the pulse in general beats more quickly in men, especially those of a bilious habit, than in women. In lean persons, whose vessels are large, it is much stronger than in the corpulent or phlegmatic.

Farther, the pulse is more forcible in adults than in children; but, in the aged, it is slow and hard.—When the atmosphere is close, and productive of rain, as well as during sedentary occupations, the pulse is languid, and perspiration is diminished. In the month of May, it is quick, and sometimes even violent: as the summer advances, the rapidity of circulation, though remaining nearly uniform, is considerably reduced in strength; so that in autumn it is slow, soft, and weak; but, on the approach of winter, the pulse becomes hard and strong.

The most powerful agents, however, on the human pulse, are the passions and affections of the mind: thus, under the influence of terror, it is unequal, small, and contracted; under that of joy, it becomes frequent and large; during anger, it is hard, and beats quickly; and lastly, in persons pursuing intense study, it is unusually languid.

According to our experience, the standard of a natural pulse in adults, in a good state of health, appears to be 72 in men, and 66 in women; though Dr. FALCONER fixes it, in general, at 75 in a minute, and its extreme acceleration at 125. Thus, we observe from his computation exhibited in a table, that, for a person whose natural pulse is 75, the beginning of fever is put down at 96; hectic fever at 108; and inflammatory fever at 120. According to this proportion, in one whose natural pulse is 60, the first of these stages should be about 77; the second, 86; the third, 96. On the other hand, a natural pulse of 80 would require them to be about 102, 115, and 128.

Independently of other symptoms, neither the *frequency* of the pulse, nor its peculiar modification, appears to be of so much consequence in diseases, as is generally imagined. Formerly, the *urine* was chiefly consulted; but, in modern times, the quacks have usurped that criterion; and physicians of great practice seem to pay particular attention to the *pulse*; as their time is equally short and valuable.—See PHYSICIAN.

PULSE, in botany, a term applicable to all grains or seeds that are gathered with the hand; being opposed to corn, &c. which are reaped or mown. It is more particularly employed to denote the seed of *leguminous vegetables*, such as pease, beans, lentils, vetches, &c.; respecting the culture of which, the reader will find an account under those respective articles.

All pulse contains a large portion of fixed air, and also of crude indigestible particles: if eaten too frequently, or in immoderate quantities, leguminous vegetables are apt to produce flatulency and costiveness; for, as such earthy particles cannot assimilate with the human fluids, they often remain in the body undigested, for a considerable length of time, to the consequent injury of the alimentary canal. Hence, persons of relaxed habits ought to eat them sparingly, and, in preparing *pease-soup*, to boil the pease undivided; by which simple expedient they may avoid the oppression of the bowels, and the heart-burn; which are generally occasioned, when these pulse are split, and deprived of their husks.

PUMICE-STONE, a hard fossil, that is frequently ejected from volcanoes: it is very light, with numerous pores, being of a white, grey, reddish-brown, or black colour.

This mineral is usefully employed in different mechanical trades, for rubbing, and smoothing or polishing wood, paste-board, metals, and stone; because, on account of its peculiar roughness and brittleness, it effectually removes all inequalities from their surfaces.

PUMP, a well-known hydraulic machine, employed for the raising of water by the pressure of the atmosphere.

The utility of pumps, in domestic life, being universally acknowledged, various contrivances have been proposed and adopted with a view to facilitate the drawing of water. Among the latest inventions, the *American Pump Engine* deserves particular notice. This machinery was contrived by MR. BENJAMIN DEARBORN, and is so constructed, that it may be conveniently added to a common pump, in order to answer the purposes of a *Fire-Engine*.—We have, therefore, furnished our readers with a plate, from the *Memoirs of the American Academy of Arts and Sciences*,

Sciences, of which the following is an accurate description :

Fig. 1. A, B, C, D, represents a pump, the form of which is similar to that of the pumps commonly employed on ship-board.

E, the spout.

F, a stopper.

D, *d*, a plank-cap, that is fitted to the pump, and provided with leather on its lower surface; being secured by the screws *a*, *b* : in the centre is a hole, through which the spear of the pump passes, and round which a leather collar is made, as represented at the the letter *c*.

g, a nut for the screw *b*.

f, a square piece of wood, that is nailed across one end of the plank-cap, through both which the screw *a* is introduced :—a hole is made through such piece and the cap, that communicates with the bore of the pump.

G, G, a wooden tube, which may be of any requisite length, and consist of any number of joints : it is made square at the lower extremity, and perforated for the reception of the cock ; the upper end being made with a *nice* shoulder.

e, a wooden cock, that opens or shuts the communication between the pump and the tube ; being furnished on the opposite side with a handle and with a lock, in case it should be found necessary.

h, *h*, are two ferules, the object of which is to prevent the tube from splitting.

H, H, braces, each of which ought to be crossed over another, as nearly at right angles as possible.

i, *i*, are irons in the form of a staple, which surround the tube, and pass through the braces ; their ends being perforated with holes for fore-locks.

K, L, M, N, is a head, made of five pieces of wood ;—*k*, *l*, *m*, *n*, a square piece, in the lower part of which is a hole for the reception of the extremity of the tube, and which piece rests on the shoulder *o*, *p* ;—to the lower end of this head is nailed a piece of leather, with a hole in its centre, similar to that made in the wood. Another piece of leather of the same form is placed on the top of the tube, and between both is a circle of thin *plate-brass* ; the two pieces of leather and the brass being pressed between the lower end of the head, and the shoulder of the tube.—Their edges are delineated at *o*, *p*.

K, N, and L, M, are the edges of two pieces of plank, of a similar width with the head, to which they are closely nailed ; each being provided with a tennon, that passes through a mortice in the end of the piece O, P : both tennons have holes for a forelock at *q*.

O, P, a piece of plank, of the same width as the sides ; the centre of which is perforated, in order that the tube may pass through ; and in each end of which is a mortice for the reception of the tennons.

N, M, a cap.

r, *r*, are two pieces nailed to the side of the tube ; the lower extremity of each is provided with a *truck*, with a view to lessen the friction of the head in its horizontal revolution.

q, *q*, represent forelocks, the design of which is to fasten down the head, and prevent the water from escaping at the joint *o*, *p*.

Q, R, is a wooden conductor ; the extremity marked with the letter Q, being solid, while the opposite end, R, is bored with a small auger.

s, a bolt, that passes through the

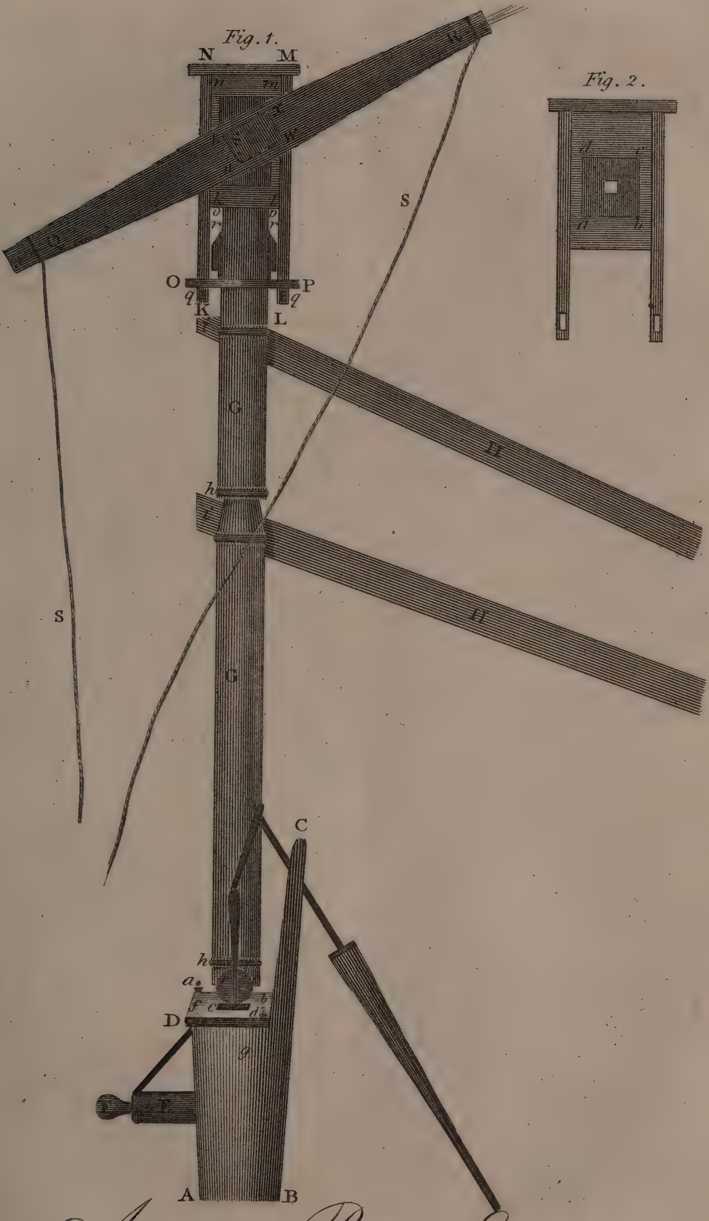


Fig. 1.

Fig. 2.

American Pump Engine.

the conductor and head, being secured on the back with a fore-lock, or nut: this bolt is rounded near the head, and square in the middle.

t, *u*, *w*, *x*, represents a piece of iron or brass, designed to prevent the head of the bolt from wearing into the wood.

S, S, are ropes for the direction of the conductor.

Fig. 2. Represents the head without such conductor.

a, *b*, *c*, *d*, is a thick brass plate, the centre of which is perforated, so as to admit a passage to impurities, that might otherwise obstruct the conductor: for which purpose a piece of leather is nailed under it to the head. The square hole in the centre is adapted to the size of the bolt, which it prevents from turning. The conductor has a hollow cut round the bolt on the inside, of the same size as the circle of holes in the brass: round such cavity is nailed, on the face of the conductor, a piece of leather, that plays on the margin of the brass-plate, when the conductor is in motion.

In the conclusion of his Memoir, Mr. DEARBORN observes, that he has raised a tube of 30 feet on his pump; and, though the severity of the season had prevented him from completing it, so that one person only could work at the brake; yet he is enabled to throw water on a contiguous building, the nearest part of which is 37 feet from the pump, and between 30 and 40 feet in height.

Numerous patents have been granted for inventions or improvements in the construction of pumps; of which the following deserve to be mentioned: namely, Mr. NOBLE's, obtained in 1784; Mr. SKEY's in 1785; Mr. FULTON's in 1788; and Mr. BUCHANAN's in 1796;—as, however, the specification of such patents, would occupy more room than our limits will permit, the curious reader will consult the earlier vols. of the *Repertory of Arts*, &c.; where they are detailed, and illustrated with engravings.

PUN, an expression, in which the same word is applied to different meanings.

The practice of punning is a miserable subterfuge employed by those who assume the character of *wits*, without possessing any talent for that invidious office. It is true, that an apposite pun, introduced with ingenuity, enlivens the conversation, and is calculated to excite innocent mirth; but, where a person assumes the profession of a *punster*, and is continually uttering senseless quibbles, he becomes a nuisance to society, and deserves to be expelled from the company of rational, thinking persons.—Nor can we approve of this paltry expedient, and the manner in which it is exercised by several of our *daily prints*:—instead of conveying useful lessons of morality, or of rural and domestic economy, abstracted from the best publications, they supply the want of political information, by ambiguous, and frequently *obscene*, *punning*.

PUNCH, a compound liquor, much used in Britain, but more frequently in Jamaica, and other parts of the West Indies.—The basis of this beverage ought to be good spring-water; which, being being rendered cool, brisk, acidulated with lemon-juice, and sweetened with fine sugar, forms an agreeable and wholesome drink, called *sherbet*:—on adding a proper quantity of brandy, rum, or arrack, the composition is then denominated *Punch*.

The proportions of the ingredients employed in making this favourite liquor, are various: in general, however, it acquires a proper degree of strength by combining four or five parts of water, with one of ardent spirit; but, in the summer season, a larger proportion of the former fluid may be used with advantage. Some persons substitute the juice of limes for that of lemons; but, in our opinion, the latter acid is not only milder, but also less injurious to the bowels.—See LIMES.

Punch, used with moderation, may occasionally serve as a *diuretic*; but, for this purpose, it should be made *weak*, and unusually acid. If, at any period of the year, such beverage be proper or harmless, it will be so in hot weather; when, according to Dr. SHORT, it tends to lessen the effects of febrile heat, and hard labour upon the body; dilutes the fluids, promotes perspiration, and is said to be well calculated to resist infection. In short, punch is supposed to be of considerable service in preventing the hurtful effects of a moist and cold atmosphere, of pestilential vapours, of unclean occupations, of a damp military camp, and sometimes, too, of a temporary abstinence from food; but it should never be resorted to by the nervous, delicate, or invalid, as a substitute for wine; in which cases it will prove a liquid poison.

PUNCHEON, a vessel of capacity for measuring liquids; it is chiefly employed for the conveyance of rum from the colonies, and contains 130 gallons, according to the wine-measure.

PUNCTURE, in farriery, a species of wound to which the feet of horses are much exposed; and which has received this name from the minuteness of the orifice; the injured parts closing up easily, so that it becomes difficult to ascertain the real depth of the wound.

Punctures are generally occasioned by the animals treading on sharp stones, broken glass, or other pointed substances, and not unfrequently from nails, when applied by clumsy farriers; in consequence of which, the sole or frog is perforated; the interior parts of the feet are wounded, and become highly inflamed. — If timely detected, punctures may be easily cured, by opening a passage for the discharge of the collected matter; after which, it will be proper to keep the foot moist by the application of emollient poultices round the hoof. Should, however, any fragments of glass, nails, &c. remain in the wound, the inflammation will increase, and at length the tumor will suppurate. The matter then accumulates; and, from the natural shape of the hoof, finding no outlet downwards, it ascends up to the coronet, where it forms a round tumor, that afterwards breaks out into a malignant ulcer called a QUITTOR-BONE; under which article we propose to state the most appropriate remedies to be adopted in such cases.

PUNISHMENT, or the penalty which a person incurs on the commission of a crime, or trespass.

The necessity of adopting rigorous measures, in cases where either natural or public law is violated, has been acknowledged by all civilized nations; among whom various modes of inflicting punishment prevail, according to the nature of the offence; or the peculiarly aggravating circumstances that attended its perpetration. It would be equally invidious and foreign to our plan, to enter into any detail respecting the *criminal code*; yet we are of opinion, that much benefit to the public might result from a different system of coercion in this country, such as would be more adapted to the spirit of the times.—And, though we readily admit, that the present modes and degrees of punishment have been wisely calculated for particular crimes; yet, while so little distinction is made between the *robber* and the *murderer*, it is to be feared, nay, daily experience proves, that *public examples* tend but little to check the progress of vice and immorality. Hence, solitary confinement, and incessant labour, appear to be better means of reformation than the transient terrors of death.

PURGATIVES, or Purging Medicines, are such as evacuate the crudities of the bowels by stool, and which are sometimes called *Cathartics*.

Purgatives constitute one of the most important branches in the *catalogue of drugs*: they differ from Laxatives only by the greater expedition with which they operate.—As we state the most useful of such drugs in alphabetical order, it would be needless to repeat the proper doses, or the occasions on which they are employed. These medicines, however, ought to be sparingly administered; for they vellicate or stimulate the fibres of the stomach; and, by abrading the lubricating fluids, the fibres of the interior vessels, and the muscles of the abdomen, become more frequently and unnaturally contracted. Farther, *drastic* purgatives should be taken with still greater caution; as their stimulating particles often powerfully accelerate the circulation of the blood; an effect, which, in robust constitutions, may sometimes be of service; but, in weakly or nervous persons, especially those of sedentary occupations, such medicines are generally productive of bad consequences, and often lay the foundation of a confirmed costiveness.

For those readers, who are apt to meddle with *physic*, on the slightest occasions, we shall lay down the following rules: 1. Purgatives ought to be taken only in cases where the crudities are disposed for evacuation, and their turgescence obviously tends downward: this circumstance may be ascertained, in acute diseases, by the weight and distention of the abdomen; flatulency; rumbling and pain in the lower belly; and an inclination to stools. 2. They must be cautiously avoided, where Nature appears to make an effort to vomit. 3. Likewise, in great weakness of the bowels. 4. To healthy individuals, whose feces are indurated, drastic purges are exceedingly detrimental; because their disposition to Costiveness (which see), is the best proof of their vigorous habit. 5. If such remedies become necessary, they should be given in the morning, when the first passages are empty; in diseases, during the intermission of paroxysms. Lastly, all nourishment, but particularly solid food, must be withheld previously to the operation of the medicine; nor should the patient be allowed much drink, till the purgative actually begin to produce its effect. Mucilaginous drinks, such as gruel, barley water, &c. are the most proper for this purpose; but, if the bowels are not opened by an ordinary dose, intead of resorting to additional drugs, it will be more safe to inject laxative CLYSTERS, which we have already stated under that head.

Purging of Horses. See HORSE MEDICINES, vol. ii. p. 489.

PURSLANE, the COMMON, or *Portulaca oleracea*, L. is a tender exotic plant, which is annually raised either on a hot-bed, or warm border, for culinary purposes: it is propagated from seed, and forms an excellent ingredient in summer salads, but is improper in the winter, on account of its cold and moist nature. —The juice of this plant is sharp, and slightly saline, so that it produces laxative effects, when taken in sufficient quantity.—There are two varieties of the *oleracea*; one having deep green, and the other, yellow leaves; both of which, however, are produced from the same seed.

PUTREFACTION, is one of the natural processes, by which all organized bodies are dissolved, and reduced into what may be termed their *original elements*.

The bodies, most liable to putrefaction, are vegetables and animals, especially those abounding with juices; but, if the latter be exhaled, or otherwise extracted, the former may be preserved for almost any length of time. The corruption of such substances may also be prevented by the addition of other matters, that tend either to harden the texture of the body, or to effect an entire decomposition of parts; in consequence of which they are converted into a state resembling that which results from spontaneous putrefaction; so that this process cannot commence. Thus, various kinds of salts, acids, and ardent spirits, indurate the flesh of animals; and are therefore advantageously employed for its preservation. Oils and gums operate in a similar manner; as they exclude the air, which is in some degree essential to complete the process of putrefaction.—See ANTISEPTICS.

In February, 1793, a patent was granted to the late Mr. JOHN DONALDSON, for a new method of preserving animal and vegetable substances from putrefaction. His *preservative* is composed of wheat or barley-meal, and a solution of any common gum or vegetable mucilage. These ingredients are made into a paste, which is to be baked in the moderate heat of an oven, contrived for that purpose; so as to prevent it from either burning or forming a crust: the dry mass is again reduced to a powder, which is now fit for use. The flesh, vegetables, &c. may be either raw, or dressed in such manner as may be found necessary: they are to be packed in wooden boxes, surrounded with the powder, and secluded from the external air.—By this method, it is stated, both animal and vegetable matters may be kept free from corruption, for an indefinite period of time.

PYRMONT-WATER, a celebrated mineral spring, discovered at Pyrmont, in the Circle of Westphalia. It is of an agreeable, though strongly acidulated taste, and emits a large portion of *gas*; which affects the persons who attend at the well, as well as those who drink the fluid, with a sensation somewhat resembling that produced by intoxication.

Pyrmont-water may be advantageously used in all cases of debility, where the constitution requires an active *tonic*, which at the same time does not excite a permanent heat; in bilious vomiting; diarrhœa; and other affections of the alimentary canal; and, when mixed with milk, in cases of the gout. It increases the secretion of urine, and sometimes occasions a temporary eruption of the skin.

The dose varies according to circumstances, and the nature of the patient's complaint; but, in general, the quantity to be taken should not exceed three pints per day.—We have given this brief account of the Pyrmont-water; as it is not only imported into Britain, but also often artificially prepared in the metropolis.

Q.

QUACKERY, or *Empiricism*, a term of extensive signification; as it relates to all those who pretend to medical knowledge and skill in the exercise of the healing art; though they act upon mere principles of slavish imitation, and the shallow inference drawn from single instances.

If the object with which medicines are administered be duly weighed; and the numerous diseases to which the human frame is exposed, be seriously considered; it must excite the greatest astonishment, that no steps are taken to suppress those insidious pretenders, who, like ephemeral insects preying on the cankered tree, exercise their predatory arts on the purse and constitution of mankind; and, that so sordid a practice should not only be tolerated, but even indirectly countenanced by the highest authority, in an enlightened country. It will probably be objected, that abuses so gross and palpable, are connived at only, on account of the revenue they produce to the Treasury; but, is it compatible with sound policy, justice, and humanity, to supply any deficiency of the State, at the expence of all that is most dear to man—his health? Beside, how often must the moral law be wounded, for the sake of this public sacrifice?—Would any person whose time-piece has received an injury; or whose cattle are attacked with the distemper; or whose dwelling threatens to tumble down, ever think of employing a vagrant in preference to either a professed watch-maker, farrier, or builder? and yet, these considerations are but trivial, when compared to the inestimable value of health! Such impostors generally assume a pompous and mysterious manner; they deal in duplicity of speech and action; *always* engage to cure, while they represent every case as highly dangerous, in order to enhance their own importance; in short, they are equally afraid, and incapable, of giving a reasonable explanation, or candid opinion: let these harpies of the deluded multitude fairly state their successful experiments, not supported by *perjury*; and compare them with the number of unfortunate victims whose credulity led them to a premature grave. Many instances of this melancholy description have come within our knowledge; and we doubt not but every medical practitioner has cases to produce, where, in consequence of taking quack medicine, his patients were afflicted with inflammations of the bowels; obstructions of the liver, or intestines; and not seldom, with incurable consumption. Humanity can only drop the silent tear of sympathy over the deluded sufferers, while the government alone has the power to suppress and punish these pests of society, and to exercise the same degree of rigorous justice as is shewn to the highway robber and assassin; whose crimes, though apparently more heinous, are less destructive in their influence on society.

QUACK-MEDICINES, are those preparations of drugs, sold in the shops under the *stamp-act*; whence they pay a certain duty to Government, from which the medicines given by regular practitioners, are wholly exempt.

The intention of the Legislature, in imposing a tax on *quack-medicines*, appears to have been the suppression of abuses, that attended the sale of *compound drugs* and *spirits*; the latter of which were formerly sold *exclusively* by the apothecaries. Since, however, these ardent liquors have found their way to a more extensive market, medicinal preparations, also, have been pirated from books on the *Materia Medica*, and other branches of physic, by speculative adventurers; who commenced an extensive wholesale and retail traffic in *ready-made* drugs, which soon attracted the attention of the goaded multitude. These imagined, that pretences so specious, and promises so flattering to their uncultivated minds, when re-echoed in every newspaper, *must* have some solid foundation; as, otherwise, the *ostensible proprietors* of such medicines could not support establishments, that involved them in considerable expence. On the other hand, a degree of sanction was often given to these undertakings, by *regular* practitioners; who, from mistaken or avaricious motives, joined the standard of empiricism. (See FEVER-POWDERS).—Thus, at length, the country has been literally inundated with motley compositions for almost every disease, so that there is always a remedy at hand, without consulting either physician or surgeon; since perfumers, grocers, toy-men, &c. are alike licensed to vend Patent and other Quack-medicines. Nay, large warehouses in the metropolis have, within the last 15 years, been opened for the greater accommodation of the public; and where no other articles are sold.—Indeed, we well remember the facetious remark made by an attentive foreigner, on his first review of the London newspapers; namely, that it was to him altogether inconceivable, how the English (who are apparently provided with the most efficacious remedies that are calculated for every particular complaint), had either chronic diseases among them, or any occasion for regular-bred medical men; and how the latter, under such circumstances, could support themselves and their families. Such, however, is not the case; and we have a greater number of hospitals, and perhaps

perhaps more patients, than any nation in Europe; while there is a constant fluctuation of quack-medicines; which, in the revolving wheel of time, appear and disappear like meteors, so that none of these nostrums has hitherto stood the test of ages. But, alas! it cannot be denied, that in the present artificial state of society, when the *three learned professions* are in a manner degraded into *trades*; when intrigue, dissimulation, family interest, and attachment to party, are the principal requisites to preferment and the acquisition of public fame (or rather *notoriety)*, that in such a state of things, quacks, and quack-medicines, should escape with impunity.—See also NOSTRUM and PHYSICIAN.

QUAIL, the COMMON, or *Tetrao coturnix*, L. a bird of passage, frequenting various parts of Europe, and appearing in Britain in the spring, whence some of these wild-fowl depart in autumn, while others remove from one county to another, and shelter themselves among weeds near the sea-side.—In general, those which remain, frequent corn-fields, and are sometimes found in meadows.

Quails resemble the partridge in shape, though they are not half of its size: they construct no nest, but a few dry leaves or stalks scraped together, or sometimes a small cavity in the ground serves for their habitation. Here, the female deposits six or seven, and, according to FUNKE, from fifteen to twenty, whitish eggs, marked with irregular rust-coloured spots; and produces but one brood in the year.

The quail is a cleanly bird, never resorting to dirty or wet places; its food is similar to that of partridges. Numbers of the former are taken by means of a net and the *call*, from the month of April till August: the proper times for this sport, are, at sun-rising, at nine o'clock in the morning, at three in the afternoon, and at sun-set; because these are the natural periods of their *calling*. The notes of the cock and hen-quail are very different; and it is remarkable, that the proportion of males, much exceeds that of female birds in this species.

The flesh of quails is considered a great dainty, being more juicy and tender than that of partridges; but, as quails feed on the seeds of darnel, hellebore, and other poisonous plants, the eating of such birds has sometimes been attended with injurious effects.—An absurd practice prevails in Italy and China, where quails are trained for *fighting*, in a manner similar to that of *cocks* in England.

QUAKING-GRASS, or *Briza*, L. a genus of plants, consisting of seven species, three of which are indigenous; and the principal of these is the *media*, Common Quaking-grass, Middle Quake-grass, Cow-quakes, or Ladies-hair: it grows in fields and pastures, and flowers in the month of May or June.—This species is eaten by cows, sheep, and goats. It makes tolerably good hay; and, as it thrives on poor, wet lands, where other grasses will not vegetate, it deserves to be cultivated in marshy situations; though its stalk seldom exceeds twelve inches in height.

QUARANTINE. See LAZARETTO.

QUARTER-EVIL, a disorder which chiefly affects calves, and other young cattle: in Staffordshire, it is termed the *irons*; in Leicestershire, *black-legs*; and in Shropshire, it is called *stricken*.

This malady generally commences with a lameness in one of the legs, attended with a high degree of inflammation; which soon extends to the body, and its principal parts: these become extremely hard, tense, and appear much distended with wind. Sometimes the tension and inflammatory symptoms first appear in the body, the dewlap, or the lower part of the rump; but, in all cases, a total stagnation of the blood and mortification of the part ensue, in consequence of which the animal dies in a few hours.

Although the quarter-evil is not supposed to be contagious, yet it generally spreads in the same herd; five, six, or seven, out of ten, upon an average, usually fall victims to this dreadful disorder.

In the 14th vol. of *Annals of Agriculture*, the following recipe is inserted by R. PROCTOR ANDERDON, Esq. who states it to be an effectual preventive of the quarter-evil, if duly administered:—Take Rue, Lavender-cotton, Common Southernwood (*Artemisia Abrotanum*), a few heads of Garlic, and a little Savin, cut very small; add to these ingredients, Flour of Sulphur, Diapente (vol. ii. p. 491), and Elecampane-Powder, half an ounce of each. Boil the whole in urine; then remove it from the fire, and let it stand till milk-warm. After taking about one quart of blood from each calf, drench the animal with two common bullocks-hornfuls of the liquor, prepared as above directed, adding to each a table-spoonful of Barbadoes tar; a little of which he might be induced to lick, by smearing it over his nose, loins, and ribs; an expedient which will promote his recovery.

QUASSIA, or *Quassia*, L. a genus of trees, consisting of three species, the principal of which is the *amara*, or Bitter Quassia; a native of the West Indies and of South America.

The root, wood, and bark of this tree, are all employed in medicine; but the latter, having a great degree of bitterness, is more efficacious.—Quassia possesses no peculiar odour; but its taste is extremely bitter. It is an excellent tonic, antiseptic, and febrifuge: being one of the least heating drugs, it has been found very serviceable in exciting appetite for food; expelling flatulency; assisting digestion; and particularly in removing costiveness, when produced by weakness of the intestines, such as is consequent on sedentary occupations. Dr. LETTSOM prescribed it with advantage, in cases of debility after febrile affections; in dyspepsy arising from intoxication, and in diarrhœas; but he directed it with the greatest success, when combined with some absorbent, in the hysteric atony of females. It may be given either in infusion, or in pills composed of the watery extract: the former preparation, however, is generally preferred, in the proportion of three or four drams of the wood, to twelve ounces of water; and which is to be taken in doses of one or two table-spoonfuls, frequently repeated.

QUAY, a large wharf, or artificial bank, on a sea or river, and which is destined to facilitate the loading or unloading of merchandize from vessels.

The utility of commodious quays to a commercial nation, is obvious: hence, in all the maritime ports of Britain, they have been constructed to a considerable extent, and furnished with capacious magazines for the reception of goods. Dwelling-houses have, also, been generally erected, for greater convenience in superintending the whole; but these, we conceive, are by no means favourable to the health of their inhabitants, on account of the continual dampness that must necessarily prevail, in consequence of their moist situation. A constant residence of certain persons, on or near *quays*, however, has of late become absolutely necessary; in order that the wharfingers may be enabled to check the numerous depredations committed by various descriptions of *river-pirates*; and other dishonest persons, who avail themselves of the opportunity afforded by the night, to defraud the revenue, as well as to rob the owners of merchandize. It would exceed the limits of our plan, to develope this *system of iniquity:* the inquisitive reader will therefore consult Mr. COLQUHOUN's *Treatise on the Commerce and Police of the River Thames*, &c. (8vo. pp. 676, 10s.6d. Mawman, 1800); in which it is fully detailed, and proper means of preventing such depredations are judiciously suggested. — See also CRANE.

QUEEN-OF-THE-MEADOWS. See MEADOW-SWEET.

QUICKEN-TREE, MOUNTAIN-ASH, or ROAN-TREE, *Sorbus aucuparia*, L. (*Pyrus aucuparia* of Dr. SMITH), an indigenous shrub growing in woods and hedges; in mountainous and boggy situations; principally in Wales, Scotland, and the northern parts of England: it flowers in the month of May.

The mountain-ash may be reared either as a shrub, or as a large tree, according to the soil in which it is planted: it flourishes best on the sides of hills, in sheltered situations, and in fertile lands, where it attains a considerable size. It forms part of many ornamental plantations, on account of the beauty of its growth, flowers, and foliage, and particularly of its red berries; which, being produced in great abundance, afford a charming appearance from the end of autumn, till they are devoured by the birds, mice, &c. in the winter.—The wood is soft, tough, and durable, being advantageously converted into tables, spokes for wheels, chairs, &c.: the roots are likewise very firm, and are formed into spoons, handles for knives, and similar utensils.

The berries of the mountain-ash, though generally devoured by black-birds and thrushes, may with more advantage be given to cattle, sheep, and especially to poultry, all of which animals eat them eagerly.—When infused in water, this fruit makes an acid liquor, resembling perry, that constitutes a principal beverage of the lower orders of the Welch people. In the island of Jura, the juice of the berries is employed as an acid for punch: on distillation, they yield a considerable portion of ardent spirit, which possesses a fine flavour; but, for this purpose, they ought to be previously frozen: we conceive, however, that these berries, when dried and pulverized, might, in times of scarcity, be more beneficially converted into a wholesome bread; though BECKMANN informs us, that 12lbs. of such fruit yielded three quarts of brandy.—In tanning, the branches, leaves, and unripe fruit of this tree, have all been usefully employed, both by GLEDITSCH and BAUTSCH.

QUICK-IN-HAND. See BALSAMINE.

QUICK-LIME. See LIME.

Quickset. See Hawthorn; Fence; and Hedge.

Quicksilver. See Mercury.

QUILLS, are the large feathers plucked from the end of the wings of geese, crows, &c. They are termed *first, seconds,* and *thirds,* from the order in which they grow in the wing: the two last, however, are principally employed for writing, on account of the larger size of their barrels.

As the utility and value of quills, in the manufacture of pens, greatly depend on their firmness and elasticity, different expedients have been contrived, with a view to divest them of their natural softness. The most simple of these, consists in thrusting the barrel into hot sand or ashes for a few moments; after which it is pressed almost flat, by means of a pen-knife, and then rendered round between the fingers, by the assistance of a piece of leather, or woollen cloth; with which their external roughness may be easily removed by friction. If, however, a considerable number of quills is to be hardened, it will be advisable to set a vessel, containing a little water and alum, over the fire: as soon as the liquor begins to boil, the barrels only must be immersed for a minute, after which they may be suspended to dry. Good pens constitute an article of indispensable necessity in all departments of trade, commerce, literature, &c. Hence, it becomes an useful, if not important object, to be able to cut them according to the most approved rules.—The reader, who is desirous of information on this head, will find some pertinent hints in Mr. Wilkes's small tract, entitled, *The Art of Making Pens scientifically,* &c. (small 8vo. 1s. Crosby and Letterman); in which plain directions are given to that effect, together with appropriate instructions for the management of the quill, pen-knife, hone, strop, and other articles, connected with the art of *pen-making.*

QUINCE-TREE, the *Pyrus Cydonia* of Linnæus, but which is considered by Miller, and other botanists, as a distinct genus of fruit-trees, under the name of *Cydonia*; and consists, according to them, of three exotic species, namely:

1. The *oblonga*, or Oblong-Quince, the fruit of which is pear-shaped, and lengthened at the base.

2. The *maliforma,* or Apple-Quince, having oval leaves, which are of a woolly texture on the lower side.

3. The *Lusitanica*, or Portuguese Quince, that has obverse, oval leaves, somewhat woolly on the upper side.

All these species are cultivated in Britain; though the most valuable is the Portuguese Quince; the pulp of which, on being stewed or baked, assumes a fine purple colour, and becomes less austere than that of the others. It is propagated by layers, suckers, or cuttings; but the last method only is calculated to produce the greatest abundance of delicious fruit. The cuttings ought, therefore, to be planted early in autumn; and, if the weather be dry, it will be advisable to water them frequently, in order to facilitate their striking root. In the second year, they should be removed into the nursery; and set, at the distance of one foot from each other, in rows three feet apart. In the course of two or three years, they may be transplanted to the place of their ultimate destination, and which should always be contiguous to some river, or the soil at least ought to be moist; as they will thus produce a greater quantity of large fruit, than if they had been set in dry situations; though such as are obtained in the latter, possess a finer flavour.

Quince-trees require very little pruning: the most important part of their management consists in clearing their stems from suckers; and in cutting off such branches as interfere with each other. All luxuriant shoots, that strike upwards from the middle of the tree, must be lopped, lest the head be too much crowded with wood, which might prevent the growth of the fruit.—Quince-trees are also highly esteemed, as stocks, on which pears may with great advantage be grafted, or budded.—This operation greatly improves the taste and flavour of those pears, which arrive at maturity in the summer and autumn; but it is by no means proper for winter-fruit, which is thus rendered hard and stony. In the colder climates of Europe, Quinces are not eatable in a raw state: nevertheless, they possess antiseptic properties, when dressed, and contain a considerable portion of acid and mucilaginous juice. Though their pulp be somewhat difficult of digestion, they seldom disagree with the weakest stomach. The liquor expressed from them, has frequently been given in small quantities, with great success in nausea, vomiting, and similar complaints.—This fruit is generally boiled and eaten with sugar, in which form it may also be usefully employed in cases of dysentery.—One quart of the juice of Quinces, mixed with one pound of sugar, and fermented, afford a delicious wine: on adding to the same quantity, one pint of the best French brandy, and four ounces of sugar, a celebrated *liqueur* is prepared on the Continent, and which is greatly prized as a cordial and stomachic, when taken in the small quantity of two or three spoonfuls, before breakfast.—By boiling the kernels of quinces in water, a mucilage is extracted, which is often used in medicine as a proper substitute for that of gum-arabic.

QUINSY, or *Sore-Throat*, is an inflammation of the internal parts of the mouth, throat, and windpipe, attended with fever.

As this frequent affection is divided into several species, each of which requires a particular treatment, it will be necessary to state the symptoms, by which they may be distinguished from each other.

The first is the *common sore-throat*, where the glands, or tonsils, situated at the posterior part of the mouth, appear swollen, red, and painful; the deglutition and respiration are difficult; it occurs in the spring and autumn, when the air is moist, and chiefly attacks the middle-aged, and those of plethoric habits. The event is generally favourable, either by resolution, or suppuration.

The second is an *inflammation of the throat*, at the posterior part of which a redness, though no swelling, is discernible; the pain is more violent than in the former; deglutition more difficult; respiration is, however, easier, but accompanied with cough and hoarseness. It likewise terminates in a few days, and in general, without danger.

The third, or *malignant sore-throat*, affects the tonsils and throat with swelling, redness, and mucous crusts of a whitish or ash-colour, which cover the ulcers: it is attended with a putrid fever, the greater or less violence of which determines the degree of apprehension for the life of the patient. —This malady originates in a contagion of the air, similar to the small-pox, and other epidemic diseases.

The fourth is an *inflammation of the windpipe*, when the breathing is difficult; the inspirations are loud; the voice is hoarse with a cough, but scarcely any visible swelling in the throat; deglutition easy; and the fever is extremely violent. This disorder frequently attacks children, from the time of weaning till the twelfth year of their age, with this peculiar circumstance, that the inside of the windpipe is lined with a substance, which is apt to obstruct the passage of the air, and thus often proves fatal by sudden suffocation, unless timely relief be procured. — See Croup.—A favourable issue, however, may be expected, if an expectoration of a yellow matter streaked with blood, or even a swelling on the side of the neck appear: which last symptom indicates, that the disease will terminate externally.

The two first species require a cooling diet, and diluent drink; such as barley-water with currant-jelly, linseed-tea with honey, &c. A large blister applied to the chest, or between the shoulders; and gargles of sage-tea, honey and vinegar, aided by bathing the feet in warm-water, will generally be sufficient to procure relief. But, if the swelling continue to increase, leeches should be applied to the outside of the neck; and recourse must be had to other means, in order to promote a suppuration: this may be effected by fumigating the throat through a funnel placed over a vessel of hot-water, into which should be thrown some camphor reduced to a coarse powder. After the disease is removed, care should be taken to avoid a relapse, by keeping the neck warm; though too anxious measures, and cravats too heating, would doubtless lead to the opposite extreme.

The cure of the *ulcerated sore-throat*, depending chiefly on the nature of the fever with which it is attended, requires the aid of a professional man: we shall, therefore, here only point out the regimen to be observed during its course. The diet ought to consist of sago, tapioca, panada with a proper quantity of wine, ripe sub-acid fruit, such as prunes, currants, raspberry-jelly, &c. Negus, perry, cyder, &c. may be allowed for drink; but the patient should always previously use the gargle above directed. His posture in bed ought to be such, that the discharge from the mouth may be facilitated, and the greatest attention must be paid to clean linen and pure air.

In the fourth species of quinsy, blood-letting is the principal remedy: hence, from three to six leeches should be immediately applied to each side of the neck, and a blister to the front; at the same time administering a brisk emetic, to dislodge the membrane which is forming; and by the removal of which, the inflammation often speedily disappears.—In this complaint, the patient should be suffered to sleep as little as possible; for no circumstance has a stronger tendency to aggravate the disease. At all events, medical advice ought not to be neglected.

QUITCH-GRASS. See DOG'S-GRASS.

QUITTOR-BONE, in farriery, a malignant tumor which is attended with great pain, inflammation, and a considerable swelling around its basis. It is generally occasioned by long-neglected PUNCTURES (which see), or such as have resisted the usual remedies employed in that affection of horse's feet.

The method of cure commonly practised in the quittor-bone, consists in perforating the tumor with numerous holes, by means of a hot iron, pointed in a pyramidal form; after which, small pieces of arsenic, or corrosive sublimate, are introduced into the cavities, where they consume, and at length separate, a mass of mortified flesh, termed by farriers, the *core*. This practice, however, is extremely dangerous, and does not always effect a cure, so that it becomes necessary to repeat it a second, and even a third time, to the consequent injury of the animal. The most eligible method, therefore, will be a speedy operation; for which purpose, a ligature must first be tied round the fetlock, in order to prevent too great a loss of blood; and then the tumor may be extirpated with a sharp crooked knife.

The wound is now to be dressed with warm *digestive*, or *emollient* POULTICES (see HORSE-MEDICINES, vol. ii. p. 491); and, when a proper suppuration is effected, the scabby parts may be sprinkled with the following escharotic, namely:—Take three ounces of lime, that is reduced to powder on exposure to the air, and one ounce of Armenian bole; let them be pulverized in a mortar, and passed through a sieve. Next, it will be advisable to cover the orifice with a pledget of dry lint; and, when the surface is nearly equal to the skin, the powder alone will be sufficient. Lastly, if the quittor-bone be attended with very acute pain, it will be advisable to resort to the remedies usually employed in inflammatory cases; in order to prevent the humours from flowing to the wounded limb. The animal ought, therefore, to be bled; and a draught, consisting of two ounces of nitre, and a similar quantity of common treacle, dissolved in one quart of water, should be given to him every morning and evening. If the horse, however, be affected with griping pains, or other internal uneasiness, the quantity of water may be increased; or the same portion of nitre may be allowed him in a mash of bran, twice every day, till the inflammatory symptoms disappear.

R.

RABBIT, the COMMON, or *Lepus cuniculus*, L. a well-known animal resembling a hare; though it is smaller, has shorter hind-legs, and its ears are thinly covered with hair: it was originally introduced into Britain from Spain.

Rabbits abound in this country: in a wild state, their fur is of a brown colour; but, when domesticated,

ticated, they are generally black, white, or pied; and their eyes are transparently red.

These animals are reared either in *warrens*, or in *hutches*; in the former state, they are permitted to roam at liberty, where they burrow and breed. The best places for such purpose are sandy hills, or those which consist of a loose soil; but it will be necessary to inclose them either with a stone or sod-wall; and at the same time to bore horizontal cavities for the passage of these quadrupeds, till they have formed their own burrows:—the most proper shrub to be planted in such situations, is the juniper-tree, the leaves of which are eagerly eaten by rabbits, and impart to their flesh a delicate, spicy flavour. As warrens are infested with kites, pole-cats, eagles, and other free-booters, it will be advisable to set traps on the stumps or tops of old trees, or on artificial hillocks of a conical form; in order to catch these depredators, as they usually alight on such places.

If rabbits are designed to be reared in a tame state, the *hutches* must be kept constantly clean; as, otherwise, these creatures will be frequently attacked with diseases. —The males, or bucks, should be parted from the *does*, or females, till the latter *kindle*; at which time one of the former may be allowed to six or eight of the latter; and a sufficient quantity of fresh hay should be provided, for the construction of a *bed*, or nest.

The females begin to breed, when about six months old; being very prolific, they bring forth, seven times in the year, from four to eight *conies* at a litter, after a gestation of thirty days; and, in the course of six weeks, the young rabbits are able to seek for their own food. The provision of these animals ought to consist of grass, cabbages, carrots, endive, clover-hay, and similar vegetables, which should be given them frequently, in a fresh, though not wet state; and, as soon as the young conies begin to disagree after being weaned, it will be necessary to separate them.

Rabbits are chiefly subject to two disorders, which, if they be not timely attended to, generally prove fatal: 1. The *rot*, which is occasioned by feeding them with too large a proportion of green vegetables, or with such as were gathered before the dew or rain was evaporated. It may, however, be prevented by strict attention to their food, and especially by mixing a certain portion of clover, or other hay, with green or moist plants. 2. A species of *madness*, which may be ascertained by their restlessness; as these animals roll themselves on the floor of their *hutches* in an uncouth manner, and hop about in odd postures. Such distemper generally arises from rank feeding, and may be cured by keeping them *low*, and giving them tare, or spear-thistles, the *Carduus lanceolatus*, L.

The usual modes of catching wild rabbits are, by what is called *purse-nets*, and by ferrets; though they are sometimes coursed with small greyhounds, or with spaniels trained up to the sport. Another method consists in *smoking* them out of their burrows, by burning sulphur and orpiment at the entrance. The deleterious fumes of these articles compel the animals to rush into the net spread for their reception; but, as their flesh may thus be rendered unwholesome, and a long time must elapse before other rabbits can be induced to enter the holes, such fetid ingredients ought never to be employed.

The rabbit is one of the most useful quadrupeds reared by mankind: its flesh is tender, and nutritious, and consequently well calculated for the food of convalescents; but they ought to be killed by a large wound in the neck, so that the blood may be speedily discharged; an operation which renders their flesh whiter and more delicate.—Their *fur* constitutes a principal article in hat-manufactories; and such part as is unfit for this purpose, may with advantage be employed in the stuffing of beds and bolsters, being little inferior to feathers.

Rack. See Arrack.

RADISH, or *Raphanus*, L. a genus of plants comprehending eight species, of which the following are the principal:

1. The *Raphanistrum*, White-flowered or Jointed Charlock, or Wild Radish, an indigenous annual plant, which abounds in corn-fields, and flowers in the months of June and July.—It is eaten by horses, but refused by cows.—This species is a troublesome weed, and should be carefully extirpated, before it runs to seed: it vegetates with great luxuriance, during wet seasons, amongst barley; and has, in Sweden, occasioned violent convulsive affections in those who ate bread made of that grain.

2. The *sativus*, Common, or Garden Radish, is an exotic species, originally from China, and which is cultivated for the table. There are several varieties of it, known under the names of the small-topped, deep-red, pale-red, or salmon, and the long-topped striped Radishes; all of which are annual plants; but the *small-topped* is generally preferred in the vicinity of London, on account of the little room which it occupies in the ground.

All these varieties are propagated from seed, which is sown at various times, from Christmas till May, to ensure a succession of radishes for the table; because they attain to perfection in the course of three months. The earlier crops ought to be sown in warm borders, sheltered from the severity of the winter; but, for the later ones, a moist soil, and an open situation, should be selected.

Radishes are esteemed aperient, attenuating, and anti-scorbutic:—when eaten in moderate quantities, they are in a certain measure salubrious to persons of strong habits; but are, in general, apt to produce a considerable degree of flatulency in those, whose stomachs are relaxed. The small-topped salad-radishes are greatly superior to the large root; as they are more easy of digestion, and tend to improve the appetite. No radishes, however, ought to be eaten when *old*, or after having been kept for some time; as they are then utterly indigestible, and render the breath extremely offensive.

Radish, the Horse. See Horse-radish.

Rags. See Manure, p. 129 of this volume.

RAG-STONE, a genus of siliceous fossils, discovered in various parts of Britain. It is of a greyish colour; contains a large proportion of particles resembling *talc*; and splits easily into thin scales. It effervesces with acids; and, though very soft, emits fire, when stricken against steel.—This mineral is employed by artificers for the purpose of giving a fine edge to knives, chissels, and other tools, which have previously been sharpened upon stones of a coarser texture.

RAGWORT, the Common, Groundsel, Seggram, or St. James's Wort; *Senecio Jacobaea*, L. a native perennial plant, growing in meadows, pastures, and on road-sides; and flowering from July to August.

Where this troublesome weed abounds, it is with great difficulty extirpated. The best method hitherto discovered, appears to be either that of plucking it up by the roots, after the ground has been moistened with showers; or *folding it closely* with sheep in the winter season; so that the heavy rains may contribute to its destruction. If the former plan be adopted, it is recommended to pile up the plants thus pulled and cleansed from earth; to burn them; and scatter the ashes on the ground; or, if this cannot be conveniently done, to leave them to rot on, and manure, the soil; as the rankness and stench of this weed prove it to be possessed of saline and fertilizing properties.—Farther, it is said to be more pernicious in meadow, than in pasture land; for, in the latter it only tends to exhaust the soil; while, in the former, it communicates to good hay a disagreeable effluvia, and deprives it of its sweet flavour.

If gathered before the flowers expand, and employed in a fresh state, the ragwort imparts to wool a fine green, though not permanent colour. But, if woollen cloth be previously boiled in alum-water, and then in a decoction of these flowers, a beautiful deep yellow shade will be produced.—Dambourney states that, by a decoction of the flowers and stalks while in blossom, the wool previously steeped in a solution of bismuth, acquired a very permanent olive-brown colour, displaying a beautiful golden shade.—When young, horses and cows eat this weed; but, after attaining its full size, when the stems are a yard high, it is refused by every species of cattle.

RAIL, or *Rallus*, L. a genus of birds, comprising twenty-four species, of which the following are the principal:

1. The *crex*, or Land-Rail, a bird of passage, which appears in Britain in the spring, and migrates to warmer climates towards the end of autumn. Its bill is short, strong, and thick; the legs are long, slender, and of an ash colour; the tail is short, and the belly of a clear white.—These birds are uniformly found among corn, grass, broom, or furze; where they deposit from twelve to twenty eggs during their residence in this country: they are remarkable for their aversion to take flight, trusting principally to the swiftness of their legs.

Land-rails abound in the Isle of Anglesea, in the Orkney, and in the Hebride Islands: their flesh is remarkably white, tender, and in great esteem at the tables of epicures.

2. The *aquaticus*, or Water-rail, frequents the sides of brooks, and damp watery places; it has a long slender body, about 12 inches in length from the tip of the beak to the point of the tail; and weighs from four to five ounces. Its bill is long and thin; the legs are of a dusky flesh-colour; the whole body is beautifully variegated; and,

though their feet are not *webbed*, as those of most other water-fowl, they swim with considerable speed.

These birds continue throughout the year in England: like the land-rail, they seldom fly, and are generally taken by means of dogs, which are trained for the purpose of *running them down.*—The flesh of the water-rail is wholesome; though inferior to that of the preceding species; and, as this bird resorts to damp and marshy situations, it acquires a peculiar *moorish* taste.

RAILS, are pieces of timber, placed on stair-cases, and also on balusters, both as a support, and to prevent accidents. They also denote those pieces of wood which are fixed within pales, in order to strengthen fences.

In April, 1782, a Patent was granted to Mr. FRANCIS UNDERWOOD, for his invention of making and ornamenting every kind of railing, balustrades, or balusters, and pannels for stair-cases, galleries, balconies, &c. both in private houses, and in churches, or other public buildings. His privilege is now expired; but, as a detail of the principles on which he proceeded, would be intelligible only to architects, the curious reader will consult the 7th volume of the *Repertory of Arts and Manufactures*, where a full specification is inserted.

RAIN, a well-known meteor, which descends from the clouds in drops of water.

Various conjectures have been formed by natural philosophers, to account for the origin of rain: it appears, however, to be universally allowed, that such phenomenon is produced from the moisture or water which is absorbed from the surface of the globe by the heat of the sun, and conveyed into the atmosphere, whence it is again precipitated upon the earth; though the specific cause is by no means clearly determined.—According to chemical principles, the air itself is a *solvent* of water, and thus contributes to the formation of rain in the clouds, when they are saturated with aqueous humours. Now, as soon as two such volumes of condensed vapour meet each other in the atmosphere, in *different temperatures*, the necessary consequence will be *precipitation*; in a manner similar to that from the vaulted ceiling or window of a cold room, when first heated.

Rain irrigates and softens the earth, thus adapting it to the nourishment of plants.—By falling on lofty mountains, and other elevated situations, this meteor carries down numerous loose particles of earth into the contiguous vallies, which are thereby not only ameliorated, or rendered more fertile; but the air is also purified from noxious exhalations, which are returned to the ground whence they were absorbed; a natural process that remarkably contributes to enrich the soil. Lastly, it moderates the temperature of the air, and affords a supply of water to fountains, brooks, rivers, &c.

But, though gentle showers be in many respects beneficial to mankind, yet vehement rains coming down in torrents occasion great injury; as they are often attended with violent inundations, which wash or carry off the finer particles into rivers, and thus impoverish the land. To remedy, in some degree, this inconvenience, it has been recommended to plant along their banks, orchards, or groves of trees, that produce esculent fruit; for, according to practical observers, such trees bear greater abundance in wet, than in dry seasons. As, however, all kinds of grain are liable to be materially damaged by storms of rain, especially after being cut, some agriculturists have advised the erection of barns at convenient distances, on large farms; where corn, &c. may be speedily housed, preserved, and much time, as well as labour, saved in the carriage: but, as these buildings would be exposed to the depredations of dishonest persons, it has farther been recommended to build, contiguously to such barns, cottages, to be inhabited by the labourers employed on the farm; by which expedient the grain will be effectually secured, both from the injuries of the weather, and from the attacks of midnight plunderers.

RAISINS, are grapes which have been suffered to remain on the vine, till they have attained to maturity; when they are either dried in an oven, or the fruit being tied together in clusters, and dipped in a ley of wood-ashes, containing a small portion of sweet-oil, is then dried by exposure to the sun, without being separated from the branches:—the latter method appears to be preferable.

The best fruits of this description, are those known under the name of *sun*, and *jar-raisins*; both of which are dried in the sun; being imported from the southern countries of Europe, and also from the Asiatic provinces of Turkey. They form a principal article of the dessert; and, when properly managed, yield an agreeable *wine*. For this purpose, let one cwt. of raisins be deprived of their stalks, chopped, and put into a wide, but not too deep vessel. Two-thirds, or fourteen gallons of water, are now to be added, and the whole suffered to stand for fifteen days, being carefully stirred once every day. At the end of that period, the raisins must be strained, pressed, and the liquor obtained from them, poured into another vessel. The remaining third part, or seven gallons of water, should next be added to the fruit, thus pressed, and likewise stand for the space of one week. The liquor is then again to be strained, and the two *runnings* are to be poured into a barrel, capable of containing twenty-one gallons, together with a quart of brandy. In order to colour the wine, three quarters of a pound of refined sugar must be set on fire, and burnt into a little of the liquor, which ought to be added to the whole; and, as soon as the fermentation ceases, the barrel may be closed, and suffered to stand till its contents are ready for bottling.—*Raisin-wine* is an agreeable, cooling liquor; but, if it be too often used, or in too large quantities, it is apt to occasion flatulency.

With respect to their properties, raisins are too frequently relished as an article of food, to be considered as a medicine. They are very nutritive, and have been recommended in *nephritic* complaints (see Kidnies); but if eaten immoderately, they contribute to the decay of the teeth, and occasion painful colics. Raisins are likewise used in pectoral decoctions, and similar medicinal preparations; for which purposes the stones ought to be carefully taken out; and also in all cases, where their astringency is not required.

RAM, the male of a sheep.

As we propose to treat of the proper management of Sheep, in that article, we shall at present only state the general marks that should characterize the appearance of a *good* ram, which is intended for the purpose of breeding. Such an animal ought to be large and well-proportioned; his head should be thick and strong, with a broad front; the eyes and nose black; the neck thick; the body long and tall; and the tail of considerable length.

Rams are capable of propagating at the age of eighteen months: and, as the fine quality of the wool depends greatly upon the judgment of the breeder, it has been recommended to take the advice of some experienced clothier, or wool-stapler; who, being accustomed to investigate wool, will be able to decide with the greatest accuracy, and also with a view to the breeder's *real* profit. The coat must likewise be minutely examined, lest it be *stitchy-haired*; for, in such case, the wool will be so materially damaged in the course of two years, that the loss cannot be recovered, without changing the whole flock, in the space of twelve or fourteen years.

Beauty of shape, and fineness of wool, however, are not the only distinguishing marks: it will, farther, be necessary to reject the animal, in case he have not a *close thick coat* along his back, and in which there is *plenty of yolk*; as otherwise it may be assumed for certain, that he is not in perfect health.

With respect to the purchasing of rams, circumspect breeders advise to procure them a short time before they are shorn, and from the *farmers, graziers,* or *owner's house*; because the animals may then be seen in their *natural state*, without the possibility of any fraud or imposition by the vender: besides, the depth or length of the *staple* may then be easily ascertained. It is, however, by no means agreed as to the proper age for purchasing rams; and many practical writers are of opinion, that *crossing the breed* is attended with little advantage: hence, they do not approve of selecting them from distant places. If the farm consist of *down-land*, it will, on their principles, be advisable to purchase animals bred on a similar soil; if it be inclosed, they should be bought off such land as is not commonable; but, in all cases, it will be proper to obtain them from an inferior soil; for they will then thrive in the new possessor's keeping; whereas, if a contrary plan be pursued, the rams will diminish in fatness, and become less healthy.

Rampion Bell-flower. See vol. ii. p. 248.

Ramsons. See Garlic, the Broad-leaved.

RAPE, or Coleseed, *Brassica Napus*, L. a valuable indigenous plant, of the uses of which we have already given a concise account, vol. i. p. 413:—we shall, therefore, add a few particulars relative to its culture, &c. to render our statement more complete.

This plant is cultivated principally for the purpose of expressing the oil from its seed, by which it is also propagated:—the best kind of the latter should be large and black; it ought to be sown in the month of June (in the proportion of 2lbs. per acre, broad-cast), with the two fore-fingers and thumb, to prevent it from shooting up in *patches*: it may likewise be drilled, at the distance

tance of 12 or 14 inches apart. Sometimes rape and turnips are sown together; but such practice is not economical; as the two crops mutually injure each other.

Rape yields most abundantly after beans, turnips, or cabbages; the soil being previously ploughed twice, *north and south*, for the better reception of the solar heat; and, if transplanted, such plants will vegetate with uncommon luxuriance, so as amply to repay the additional expence. For this purpose, Mr. Hazard (*Letters and Papers of the Bath and West of England Society*, &c. vol. iv.) recommends one rood to be sown in the middle of June, and to remove the young plants towards the middle of August, into ridges two feet apart, and at the distance of sixteen inches from each other. As soon as they have taken root, and begin to shoot up, it will be necessary to manage them by the horse or hand-hoe; and to draw the earth around their stems. A rood of land, thus sown, will, according to his experience, produce a sufficient number of plants for the stocking of *ten* acres; and in the following spring the leaves may be fed off with sheep; because new ones will immediately succeed. But, as these tender plants are much infested by slugs, which devour them with avidity, it will be advisable to scatter over them a mixture of slaked lime and wood-ashes, in the proportion of 10 bushels of the former, to 15 of the latter, per acre.

Rape-seed attains to maturity from July to September; and, as it is easily shed, the plants are generally cut with sickles; laid on the ground to dry; and the seed is rubbed out on a large cloth spread in the middle of the field, whence it is conveyed to the mill. The oil which these seeds yield by expression, is employed for various useful purposes in domestic life, and particularly for burning in lamps; but, as it is apt to become rancid, M. Thenard has published the following practical method of *purifying* it. He directs 1½ or 2 parts of concentrated sulphuric acid to be added to 100 parts of oil, and the whole to be perfectly incorporated by agitation: the fluid immediately becomes turbid, assuming a dark-green cast; and, in the course of three quarters of an hour, the colouring particles begin to collect in lumps. The agitation must now cease; and double the weight of oil of vitriol, diluted with pure water, should be added:—in order to mingle these different ingredients, the stirring ought to be renewed for the space of half an hour; after which the whole may be left to settle for seven or eight days. At the end of that time, the oil will be found on the surface; on being gently drawn off, and filtred through cotton or wool, it will be almost entirely divested of colour, smell, and taste; so that it will burn clear, without any interruption.

The refuse of rape, after expressing the oil, is known by the name of *rape-cake*; the economical uses of which we have already stated, vol. i. p. 413.—The whole plant is of great service in feeding cattle; and, after the seed is threshed, the straw and chaff, on being burnt, afford ashes equally valuable as the best pot-ashes.

Lastly, if *rape-straw* be strong, it may be advantageously employed for inclosing fences in farm-yards; and, with still greater profit, for littering straw-yards, cow-sheds, or other receptacles for *stall-fed* cattle.

RASH-BERRIES. See Great BILBERRY.

RASPBERRY, the COMMON, BRAMBLE, FRAMBOISE HIND-BERRY, or RASPIS; *Rubus Idaeus*, L. an indigenous plant growing in damp woods and hedges; in thickets, and gravelly places near rivulets: it flowers in the months of May and June.—The fruit of this shrub, in a natural state, is fragrant, sub-acid, cooling, and very grateful: when used as an ingredient in sweet-meats, or fermented with sugar, and converted into wine, or vinegar, its flavour is greatly improved.—The white berries are sweeter than the red, but they are generally more contaminated by insects.—When eaten in any quantity, and occasionally held in the mouth, this fruit is said to dissolve tartarous concretions formed on the teeth; though, for such purpose, it is supposed to be inferior to *Strawberries*.—The young and fresh leaves of the Common Raspberry are eagerly eaten by kids.

By cultivating this shrub for *espaliers*, the size and flavour of its fruit is susceptible of great improvement. BECHSTEIN, therefore, prefers the rearing of it from seed, which affords finer berries than may be obtained, either by setting divided roots, or cuttings. With such intention, we can, from experience, state the following exotic species, as being eminently adapted to the purpose:

1. The *Rubus occidentalis*, L. or Virginian Raspberry-bush, with a prickly stem: its fruit is white, black, sometimes dark-red, uncommonly delicious, but smaller than that of the indigenous species: it thrives in the open air of our climate.

2. The *Rubus odoratus*, L. or Sweet-scented Raspberry, with a plain stalk, bearing many rose-coloured flowers, and numerous palmated leaves. It attains the height of eight feet, and forms a spreading shrub, with close foliage. Its bright-red berries are of a peculiar flat shape, and have an agreeable sub-acid, vinous taste.

3. The *Rubus arcticus*, or Northern Raspberry, a native of the damp regions of Sweden, Russia, and Canada. The berry of this remarkable shrub is dark-red: it excels in taste and flavour all the indigenous fruit of Europe. From its rich, saccharine juice, the natives of those countries prepare a most delicious wine: the berries are also preserved in sugar, or dried, and in that state exported to distant climates.

RAT, or *Mus*, L. a genus of quadrupeds, comprising 60 species, of which the following are the principal:

1. The *decumanus*, Brown or Water Rat, which is a native of the East Indies; whence it has, within the last century, been introduced into Europe by the ships returning from that country. The head and body are about nine inches in length, the upper parts being of a light-brown cast, intermixed with a tawny or ash-colour: its naked scaly tail consists of 200 rings, and measures from seven to eight inches in length.

Water-rats inhabit holes which they burrow near the banks of rivers and pools, and which are provided with two apertures; one being above ground among the grass, while the other is concealed beneath the surface of the water. As they will forsake the situation, if they cannot hide their upper avenue among weeds, &c. Dr. DARWIN is of opinion, that they may be driven away by keeping the rim or margin round fish-ponds so low, as to rise only two, three, or at most four inches above the level of the water; and also by eradicating high grass and weeds. These animals, however, infest drains, aqueducts, stables, barns, gardens, and houses, as well as rivers; they swim and dive very dexterously; commit great depredations on vegetables, grain, fruits, and even poultry; nay, they sometimes attack and eat living pigs. Considerable stores of acorns, beech-mast, and other articles, are often found in their holes, as a provision for the winter, during which the males live by themselves, while the females, and young rats subsist in barns, out-houses, and similar buildings.

Being uncommonly prolific, the water-rat produces from 12 to 19 young at a litter; and, when unable to procure food from a particular spot, they migrate, in large companies, to towns and villages, where they disperse themselves in different dwellings, and devour the common or house-rat. These creatures are so fierce and intrepid, that they will even resist, and bite their pursuers, inflicting dangerous wounds, which are attended with great inflammation, and not easily healed.

2. The *rattus*, Black or Common Rat, is a native of Europe, and Asia, whence it has been conveyed in ships to Africa and America. Its head and body are seven inches long; the back is of a deep blackish-grey, and the lower parts of an ash-colour; the tail is very thin and scaly, consisting of 250 rings, and measuring 8 inches in length. These animals have, since the introduction of the water-rat, considerably decreased in some parts of Europe, and in a few places have entirely been exterminated; but they still abound in Britain, where they continue to multiply; though different expedients are constantly employed for their extermination. The female is furnished with ten teats, and brings forth several times in the year, from five to six at a litter.

The common rat inhabits barns, granaries, and houses; in the latter of which it forms nests, between the floors and ceilings, as well as in the vacant spaces between the wainscot and wall. From these recesses, they sally forth in search of food, devouring meat, paper, corn, clothes, poultry, game; and even gnawing the extremities of infants, when asleep: instances have occurred, where these vermin have increased to such an alarming degree, that the inhabitants have been compelled to abandon their houses.

On account of the extensive damage occasioned by both these predatory species, various methods of extirpating them are practised, with greater or less success. Dogs, cats, ferrets, and weazels, are their natural enemies; and, though such useful animals destroy great numbers, yet the killing or taking of rats furnishes employment to many skilful men, who pursue different ways of catching them; and who are known under the name of *Rat-catchers*.

Rats are often caught in traps baited with burnt leather, or toasted cheese; but a more efficacious method of destroying them, consists in mixing a quart of oatmeal with six drops of oil of rhodium, one grain of musk, and two or three fruits of the *nux vomica* finely pulverized; and forming the whole into *pellets*, which must be placed near their holes. This recipe was first published in the Letters of the Bath Society, where it is observed, that the rats ate eagerly at first, and that great numbers were killed; but, after a short time, they declined to devour it. Hence, a more alluring substitute was recommended, namely, three parts of oatmeal, and one of staves-acre, made into a paste with honey, which should be divided into small pieces, and laid at the entrance of their avenues.

Another composition has been made of wheaten flour, sugar, and water, kneaded into a paste, and scented with a few drops of oil of caraway-seeds: small portions are to be exposed at stated times near their holes, till the animals, lulled into security, collect in considerable numbers. It will then be advisable to incorporate a sufficient quantity of arsenic, finely levigated, with the paste, and thus to render it a fatal poison for mice and rats.

Toward the close of the year 1800, Mr. Cundell obtained a patent for a new compound invented by him, with a view to destroy rats.—He directs eight ounces of calomel to be mixed with fourteen ounces of dried and pulverized *solanum* (night-shade); fifty-six pounds of oatmeal; six pounds of melasses, and a sufficient quantity of oil of rhodium, to communicate a fragrant smell: the whole is to be formed into a mass with sweet oil.

Beside these remedies, there are many other contrivances for exterminating rats: and, as the subject is of considerable importance to every house-keeper, we shall subjoin an account of several other means, which have been found remarkably successful.

Mr. Charles Taylor, Secretary to the Society for the Encouragement of Arts, &c. directs one or two table-spoonfuls of dry oatmeal to be uniformly, but thinly, spread on a tile or plate, in order that the quantity taken away may be more easily ascertained. The rats, if not interrupted, will regularly feed there; and they must be supplied for two or three successive days with fresh meal, when three drops of oil of aniseed are to be mixed with a double portion of oatmeal; and the composition deposited at the usual place, for a similar period of time. On the fourth day, one half only of the usual quantity must be given of the scented preparation, and on the succeeding night, the following mixture must be placed at the hole:—Let four ounces of dry oatmeal, perfumed with six drops of the oil of aniseed, be thoroughly incorporated with half an ounce of carbonated barytes (äerated heavy spar of Derbyshire), which has been previously pulverized, and sifted through fine cambric or muslin. This compound must be spread on the tile or slate, and exposed as usual; all the doors, or other communications, being shut for the space of 24 hours, that the vermin may eat it undisturbed by any cats, dogs, or other animals; and also to prevent the possibility of any accident happening to the latter. In the course of a few hours, after the rats have eaten the composition, they will be seen frequently to reel about, as if they were intoxicated, or paralytic; though, at length, they return to their haunts, and perish. Mr. TAYLOR observes that, as they are very cunning, the mixture ought to be left for 48 hours, in case a small portion only be eaten; after which time the remainder should be burnt.

Mr. FUNKE, in his valuable Natural History, calculated for German Schools, communicates the following curious method of expelling, or rather dispersing, rats from dwelling-houses: — Take one or more of these predatory creatures caught alive in a trap, and immerse them to the neck in a mixture consisting of equal quantities of tar and train oil: thus anointed, set the animals at liberty. The offensive smell of this preparation compels them to traverse all the holes of their companions with the most distressing anxiety; in consequence of which they collectively disappear.—Another expedient practised in Germany, is that of confining a live rat in a cage, and feeding it exclusively with living mice or rats. Having been for some time accustomed to such food, the captive animal is, after a short fasting, suffered to return to its former habitation, where it is said to persecute, and indiscriminately devour its own species.

M. GASCHITZ, one of the most esteemed German writers on economy, states the following to be an effectual remedy for destroying not only *moles* and *mice*, but also *rats* infesting orchards, and injuring the roots of fruit-trees:—Boil a number of fresh walnuts divested of their external green rind, for an hour and half in water; to which a large handful of hemlock leaves has previously been added. As all these vermin are extremely fond of such nuts, place one of the latter thus prepared within the cavity of every mole-hill. Those which partake of this envenomed fruit, must inevitably perish. The same author advises gardeners to plant a single clove of garlic near every tree; in consequence of which simple practice, neither mice nor rats will approach it. He observes, that the strong odour of this bulbous root is probably offensive to their organs of breathing; and, whatever be the cause, he pledges himself for the success of the experiment.

In Sweden, the green branches of the Bird-Cherry (*Prunus Padus*, L.) are successfully employed for the dispersion of *rats*, *moles*, and *bugs*, when placed in the corners of granaries, stables, dwelling-houses, and mole-hills; but it will be necessary to re-place the dry sprigs, once a-week, or fortnight, with fresh branches.

Among other remedies, we recommend that commonly employed on the Continent, where a sponge is fried with salt-butter in a pan; then compressed between two plates; and cut into small pieces, which are scattered about the holes frequented by *rats* and *mice*. This preparation is devoured with avidity; it excites thirst in the animals, which should be gratified, by exposing shallow vessels containing water. On drinking this fluid, after having swallowed the burnt sponge, it distends their stomach, and proves a fatal repast.

M. *v. d.* HORST, a landed proprietor in Germany, has lately announced in one of the public journals, that a *peacock* kept in a poultry-yard, or about the premises of a dwelling-house infested with rats and mice, is an excellent scarecrow against such free-booters: nay, he remarks, that even a *cock* of an early spring-brood, has so shrill and penetrating a voice, as to answer the same purpose. With regard to the former bird, he appeals to his own experience, which has furnished him with satisfactory proofs of success.

Lastly, as most of the methods before suggested, are either troublesome and precarious, or only partial means of exterminating the object of our research, we shall conclude with a more general and summary process of entrapping rats, so as to deliver not only our own habitations, but those of our neighbours, from the incursions of such mischievous quadrupeds. For the discovery of the following *complete* remedy, we are indebted to G. W. Müller, an ingenious apothecary of Wernigerode, in Germany: he candidly acknowledges to have derived the first hint for such purpose, many years since, from a book written by a celebrated economist; in short, it will be found the most expeditious and effectual mode that can be pursued.—A capacious cask of moderate height must previously be procured, and put in the vicinity of places infested with rats. During the first week, this vessel is employed only to allure the rats to visit the solid top of the cask, by means of boards or planks arranged in a sloping direction to the floor, which are every day strewed with oatmeal, or any other food equally grateful to their palate; and the principal part of which is exposed on the surface. After having thus been lulled into security, and accustomed to find a regular supply for their meals, a skin of parchment is substituted for the wooden top of the cask, and the former is cut, for several inches, with transverse incisions through the centre, so as to yield on the smallest pressure. At the same time, a few gallons of water, to the depth of five or six inches, are poured into the empty cask. In the middle of this element, a brick or stone is placed, so as to project one or two inches above the fluid; and that one rat may find on the former, a place of refuge. These preparatory measures being taken, the boards as well as the top of the cask should now be furnished with proper bait, in order to induce them to repeat their visits. No sooner does one of these marauders plunge through the section of the parchment into the vessel, than it retreats to the brick or stone, and commences its lamentations for relief. Nor are its whining notes uttered in vain: others soon follow, and share the same fate; when a dreadful conflict begins among them, to decide the possession of the dry asylum. Battles follow in rapid succession, attended with such loud and noisy shrieks, that all the rats in the neighbourhood hasten to the fatal spot, where they experience similar disasters. Thus, hundreds may be caught by a stratagem, which might be greatly facilitated by exposing a living rat taken in a trap, or purchased from a professional rat-catcher.—Nay, if it be true, that a whole inhabitable island on the western coast of Scotland be infested with these destructive vermin, we are of opinion, that they could thus be speedily exterminated; and that the carcasses of such animals as have hitherto been considered as useless, might be advantageously employed for the purposes of manuring the barren soil of those inhospitable regions.

RAT-TAILS, in farriery, denote certain excrescences that gradually extend from the pastern to the middle of a horse's shanks; and which are thus denominated, from the resemblance they bear to the tail of a *rat.*—These warts sometimes appear moist; at others, dry: in the former case, they may be treated in a manner similar to that recommended under the article GREASE; but, if the part affected be hard and dry, recourse should be had to the following ointment:—Take of crude mercury one ounce; Venice turpentine half an ounce; mix them together in a mortar, till the globules of the quicksilver disappear; then gradually add two ounces of melted hog's-lard. This unguent must be applied to the excrescences; and, if it should not effectually soften them, and remove the protuberances, another preparation may be used with advantage:—Let four ounces of black soap, and two ounces of quick-lime, be incorporated with a sufficient quantity of vinegar, to form an ointment.

Should the warts still remain hard, it will be necessary to pare them carefully with a sharp knife; and to dress the wound with turpentine, tar, and honey; to which may occasionally be added a little verdigrease, or white vitriol.

RATAFIA, a species of *liqueur* prepared by imparting to ardent spirit the flavour of various kinds of fruit, especially that of cherries: there are different sorts of this compound, known under the names of common, red, and dry ratafia.

Common ratafia is obtained by infusing 2 oz. of nutmegs, 2½ lbs. of bitter almonds, 2lb. of Lisbon sugar, and 2½ grains of ambergrease in 10 quarts of clear proof spirit. It will be proper to bruise the nutmegs and almonds; and also to triturate the ambergrease with the sugar in a mortar, before they are added to the other ingredients; and, when the whole has digested for a sufficient time, it may be filtred through a bag, and kept for use in close vessels.

Red Ratafia:—Take 24 lbs. of *black-heart cherries*, 4 lbs. of the *common black cherries*, 3 lbs. of raspberries, and the same quantity of strawberries, which must be deprived of their stalks, and then bruised. In this state, they are to remain for the space of 12 hours; when the juice should be expressed, and a quarter of a pound of sugar be added to each pint. As soon as the latter is completely dissolved, the whole ought to be filtred, and mixed with three quarts of clear proof spirit. Next, one ounce of cinnamon, two drams of mace, and half a dram of cloves are to be bruised, and poured into an alembic, together with two pints of spirits, and one pint of water:—one quart of spicy spirit should be drawn off with a brisk fire, and be added to the liquor: when the whole has properly subsided, it may be decanted for use.

Dry, or sharp Ratafia:—Take 30 lbs. of cherries, a similar quantity of gooseberries, 7 lbs. of mulberries, and 10 lbs. of raspberries. These fruits must be cleaned, picked, and bruised; after which they should be suffered to stand for 12 hours. The juice is then to be expressed, and combined with three ounces of sugar to each pint. When the latter is dissolved, the liquor must be filtred, and four pints of pure proof spirit mixed with every five pints of the former, together with the same quantity of *spicy-spirit,* as directed for Red Ratafia.

The chief use of this expensive liquor is, for imparting an agreeable flavour to puddings, pies, &c.; though, we fear, too many avail themselves of such pretext, and thus become habitual votaries to *dram-drinking*; than which, nothing is fraught with more mischievous effects, especially to females.—See BRANDY and GIN.

RATTLE-SNAKE-ROOT, or *Polygala Senega,* L. is a native of North America, whence it has been introduced into Britain. It is propagated by planting the roots in beds of light rich earth, and sheltering them from the severity of the winter, by means of tanners' bark.—This plant flowers in Britain in the month of July; having received its name from its supposed efficacy in curing the bite of rattle-snakes.—On account of its powerfully emetic and purgative properties, it has been found of great service in *pleurisies*; though we consider it a very hazardous remedy, that cannot with safety be taken in pleuritic, or other inflammatory affections, unless prescribed by a professional man.—As this root promotes expectoration, and the secretion of urine, it has often been advantageously given both to the asthmatic, in whom pituitous humours abound, and to the dropsical, in doses of 10 or 15 grains, combined with a little sugar; but such patients must observe a strictly cooling regimen, and neither indulge in wine nor animal food.

RAVEN, or *Corvus corax,* L. a well-known British bird, about two feet in length, and weighing in general three pounds: it much resembles a crow, but is of a blacker colour, finely glossed with a rich blue.

The raven is a very docile bird, and may be trained to fowling like hawks; to fetch and carry small objects in a manner similar to spaniels; it may also be taught to prattle like a parrot, and to imitate the human voice in singing.—The female constructs her nest in high trees, early in the spring, laying from 3 to 6 eggs of a pale bluish-green colour, with brown spots.

Ravens are proverbially addicted to theft, often secreting coins, silver spoons, and other glittering substances. They frequent the vicinity of great towns, where they devour carcasses and impurities, which would otherwise prove a nuisance. Notwithstanding these useful services, they frequently occasion havoc among hares, rabbits, geese, ducks, chickens, and young lambs which have been dropped in a weak state.—Their note is dismal; their scent remarkably acute, and they are, by some authors, supposed to attain the age of 100 years.

The flesh of ravens, though rank and unsavoury, is eaten by the Greenlanders, who also employ the feathered skins as a warm under-covering.—The quills of these birds are likewise of service in drawing, writing, and especially to musical instrument makers, for giving melody to the lower notes of harpsichords; for which purpose, they are often sold at the price of 12s. per hundred.

There is a simple method of taking ravens practised on the Continent: A strong sheet of paper is turned in the form of a sugar-loaf; the inside of which must be smeared with bird-lime, and a small piece of meat fastened to the narrow

row part of the cone.—Another stratagem is employed, by exposing oblong slices of animal flesh in a semi-putrid state, with small fish-hooks concealed in the middle, and connected with a strong line, which is covered with snow or moss, and attached to a tree, or otherwise secured.

A larger and more palatable species of these birds, is the WOOD-RAVEN *(Corvus graculus)*, which attains the size of a full-grown cock; builds nests on mountains, towers, and within the crevices of rocks; whence its young are taken with great danger to the pursuers, and dressed for the table of epicures.

RAY-FISH, or *Raja*, L. a genus of the finny tribe, subsisting on muscles, small fish, &c. comprising nine species, of which the following are the most remarkable.

1. The *batis*. See SKATE.

2. The *aspera*, or ROUGH RAY, is found in Loch Broom, in Scotland. From the point of the nose to the end of the tail, it measures upwards of five feet in length. The upper part of the body is of an ash-brown colour, streaked with white; spotted with black; and covered with small spines. The tail is furnished with three rows of large spines, such as are likewise on the fins, and lower surface of the body. This fish, we believe, is eaten only in times of scarcity.

3. The *torpedo*, ELECTRIC RAY, or cramp-fish, is often caught in Torbay, Devonshire, at the depth of about forty fathoms. It attains a prodigious size, and frequently weighs upwards of 80lbs. Its head and body are nearly circular; the upper parts being ash-brown; and the lower belly white. This animal feeds upon fish, which it stupefies by its electric stroke.—The cramp-fish also gives a violent shock to those who tread upon, or take it in their hands; a phenomenon which is attributed to two sets of very small cylindrical vessels that lie beneath the skin; one being electrified *positively*, and the other *negatively*, apparently at the pleasure of the fish.

4. The *clavata*. See THORNBACK.

5. The *pastinaca*, or STING-RAY, is also found in the British Seas. Its body is perfectly smooth, mucilaginous, almost round, and much thicker than any other ray-fish. This species sheds its spine, which is renewed annually; it is caught with danger to the pursuers; and is not only remarkable on account of the severe wounds it inflicts (which are very difficult to cure; though they are not venomous, as was formerly believed), but likewise esteemed a good dish, when young and tender. Numbers are taken near Heligoland, at the mouth of the Elbe; and FUNKE informs us, that their flat bodies, in general, exceed two feet in breadth, though only an inch thick; but that they sometimes attain a very considerable size, weighing several cwt.—The smooth ray-fish is thence exported in a dried state; and from its liver is obtained a white species of train-oil.

RAY-GRASS. See DARNEL, the Red.

RAZOR, an instrument employed for the purpose of removing the hair from the human beard or head.

As *shaving* is to many persons a painful operation, cutlers have applied all their skill and ingenuity, to remedy such inconvenience.—Hence strops, and washes, or soaps of a peculiar nature, have been contrived, with a view to facilitate that process; and some artists have so far succeeded, as to produce excellent instruments: the best, however, we believe, are those manufactured by Mr. Savigny, of King-street, Covent-garden; who has brought his *Patent Razors* to the highest degree of perfection, of which they are perhaps susceptible.

Much, however, depends upon the manner in which the razor is managed. The hone, therefore, ought first to be wiped perfectly clean, after which a few drops of sweet oil must be poured on it. The operator should next place his thumb and fore-finger *sideways*, on the part of the *heel*, in order to take firm hold both of the blade and of its handle: one side of the razor is next to be laid flat across the hone, in such a manner that its shoulder (or the part contiguous to the *heel*), may touch the nearest part of the stone. The razor is now drawn towards the person, somewhat circularly, and with a slight pressure, till he arrives at the point. When such side has been thus passed for a few times, the opposite one is to be conducted in a similar manner, till the edge uniformly assumes a *wiry* appearance. Lastly, both sides are to be moved a few times across the hone, from the heel to the point; in order that a perfect regularity may be produced in every part of the edge.

The razor, being thus *honed*, must now be drawn obliquely, from the *point* to the *heel*, across a strop, that is perfectly flat; and which is furnished with two leathers on the smoothing side: after this operation, it is fit for immediate use.—It deserves, however, to be mentioned, that those boasted powders, or unctuous preparations for giving a fine edge to razors, consist merely of *crocus martis*, or the red calx of vitriol, which is spread on the strop, by mixing it with a little oil or tallow.

Those of our readers, whose faces smart from the use of indifferent razors, or who may wish for farther instructions relative to their management, will meet with some pertinent hints on this subject, in Mr. Kingsbury's *Treatise on Razors*, &c. (8vo. 1s. 6d. 1797); in which it is fully and perspicuously discussed.

READING, is the art of delivering written language, with precision, energy, and a proper adaptation of voice.

This art is one of the most pleasing in domestic or civilized life; yet there are few, comparatively speaking, who possess, or endeavour to acquire it, so as to be enabled to read fluently; and, by placing the emphasis as well as the accents on proper words, to convey the full meaning of an author to the hearer. Hence they become frequently indistinct, and sometimes unintelligible.

It would exceed our limits, to point out the faults or imperfections that prevail in the general method of reading, both at home and in the pulpit; yet we deem it our duty to observe, that the principal indistinctness arises from too great precipitation of speech, which is acquired by a vitiated mode of teaching or communicating this art to children. The first object of British school-masters should be, to render their pupils familiarly acquainted with *written* language, so that they may be enabled to pronounce the *printed* text of books with the greater facility. Thus, juvenile scholars would not be induced to imagine that, in proportion as they advance in the ready articulation of syllables and words, the true excellence, or beauty of reading, consists wholly in the rapidity with which they are enabled to utter sounds, and to imitate the mechanism of language. Such defect may, however, be rectified, or avoided, by allotting certain hours for reading *aloud,* in a slow and distinct manner, and in the presence of a person, who is competent to point out errors, or to remind the reader, in case he should relapse into his former volubility.

There are numerous precepts that relate to this useful art; but we cannot specify and illustrate them, here, by proper examples. Those of our readers, who are studious of improvement, will meet with excellent instructions in Mr. SHERIDAN'S *Lectures on Elocution,* (8vo. 7s.); and especially in Mr. WALKER'S *Elements of Elocution,* (2 vols. 8vo. 12s.); in which proper rules are given, in clear and perspicuous language, and enforced by extracts from the best English writers.

RE-ANIMATION: See ANIMATION, COLD, &c.

REAPING, the operation of cutting corn, whether by the sickle, or by the scythe.

The most common practice of reaping is with sickles; though, where the scythe can be conveniently employed, it is certainly preferable, on account of its being less fatiguing, and far more expeditious. We are aware of the objections made by farmers against the latter instrument, namely, that it shakes the ear, and consequently numerous grains must be lost; and that considerable quantities are wasted, by the exposed state in which the corn is left, after being cut down. It is farther urged, that mowing is not only injurious to the health of the labourer, but also mixes noxious weeds among the grain; which, when sown the succeeding year, often completely stifle the growth of the rising crop.

On the other hand, it may be maintained that, if a good scythe be judiciously managed by a skilful mower, the corn will both be cut more regularly, and fall to the ground with less concussion than if a sickle were employed. Thus, if the labourer work in the manner directed in the article MOWING, the objection arising from the unhealthiness of the practice will be completely obviated. On the whole, we are of opinion, that *reaping* is far more troublesome; and, as the reapers must be continually bending forward, more prejudicial to their health than *mowing.* To facilitate the latter operation, therefore, we propose to give in its proper place, an account of the best SCYTHES, that may be most advantageously substituted for sickles.

RECEIPT, in Commerce, is an acquittance or discharge in writing; the purport of which is, that the party has received a certain sum of money, either in full for the whole of a debt, in part, or on account.

As designing persons might attempt to evade the stamp-duty, the legislature has provided that no receipt shall be valid, unless it be written on stamped paper, according to the value or amount of the payment to be made. Besides, there are various penalties imposed by different acts of parliament, on the parties giving and receiving unstamped acknowledgments. We have, therefore, subjoined the following table.

RECEIPTS.

For	2*l.* and less than	20*l.*	2*d.*
—	20	50	4*d.*
—	50	100	6*d.*
—	100	500	1*s.*
—	500 and upwards		2*s.*
In full of all demands			2*s.*

RED, is one of the simple or primary colours, into which the rays of light divide themselves, on being refracted through a prism.

The principal *reds* employed in painting are, carmine, rose-pink, red-lead, and vermilion; of the preparation of which, the reader will find a concise account, vol. ii. p. 36.

In dyeing, the chief articles that afford a red shade, with its different varieties, are kermes, cochineal, and madder.—See DYEING, vol. ii. pp. 203-5.

In the 2d volume of the *New Memoirs of the Royal Academy of Sciences*, &c. of Berlin, we meet with a communication by M. MARGRAAFF, containing an account of an excellent *red paint.* Its component parts are Dutch madder, and alum; which, being mixed with a small portion of the oil of poppies, afford a colour of exquisite beauty and lustre, far superior to the red obtained from cochineal, or any other vegetable substitute; while it is considerably cheaper; though, he observes, the quantity of distilled water used in the process, increases the expence of the preparation.

RED-INK, is a coloured liquor employed for the ruling of account-books, and other mercantile purposes. It is prepared by infusing 4 ounces of the raspings of Brazil-wood, and 2 drams of pulverized alum, in equal quantities, namely, a pint of rain-water and vinegar, for two or three days; at the expiration of which time, the infusion is boiled over a moderate fire, till the third part of the fluid be evaporated. It is then suffered to stand for three or four days, when it is filtred through blotting-paper, and preserved for use, in close vessels. There is no occasion for adding any gum-arabic, which only tends to suspend impurities, while it changes the ink to a pale purple shade.—Another mode of making red-ink, consists in triturating the whites of four eggs, and a tea-spoonful of pounded lump-sugar, with a similar quantity of spirit of wine, till they acquire an uniform consistence. Vermilion is then to be incorporated in such a proportion as will produce a red colour of sufficient strength. The liquor must be kept in a well-closed vessel, and agitated every time before it is used.

RED-BREAST, or ROBIN-RED-BREAST, *Motacilla rubecula*, L. a little bird, the body of which is of a greenish ash colour; and the forehead, throat, neck, and breast, are marked with a rufous orange shade.

This familiar and diminutive creature inhabits Britain, and the whole Continent of Europe.—It abounds in several provinces of

France, where numbers are caught for the table, being there esteemed a great delicacy.

Red-breasts construct their nests either in some low bush near the ground, or in retired parts of old buildings. The female lays twice annually, from five to six dusky-white eggs, marked with reddish spots.

Insects are the favourite and general food of these birds: there are none of the feathered tribe more tame and useful than the Red-breast, which closely attends the gardener, when at work with the spade, with the view of obtaining worms: and, frequently in the winter season, enters houses, where the doors or windows are open, when it picks up the crumbs from the table, while the family are at dinner.

Red-Lead: See Lead; p. 76.

Red Morocco: See Pheasant's-eye.

Red-rot: See Sundew, the Round-leaved.

Red-water: See Lamb; p. 59.

REDDLE, Raddle, or Ruddle, a species of marle, found in various parts of Britain, particularly in the counties of Stafford and Derby.

This mineral is of a deep-red colour; and, on being handled, stains the fingers. It consists of clay and oxyd of iron; falls to powder in water; and, when heated in the fire, becomes black.

Reddle is used in the manufacture of colours; in the marking of sheep; and, we understand, has lately been employed in Staffordshire, with great advantage, as a manure.

REED, or *Arundo*, L. a genus of plants, comprising ten species; five being natives of Britain; of which the following are the principal, namely:

1. The *arenaria (Calamagrostis arenaria* of Dr. Withering) or Sea-Reed.—See Matweed.

2. The *phragmites*, or Common Reed, grows in rivers, lakes, ditches, and fenny or marshy situations, to the height of seven or eight feet: it is perennial, and flowers in the month of July.—This species is employed for covering cottages and barns; for which purpose it is superior to every other indigenous vegetable, being incomparably more neat and durable. By previously soaking the reeds in strong alum-water, such a roof may be rendered *fire-proof*. They are also manufactured into screens, for sheltering young plants from the cold winds; and may be usefully employed for cane-bottomed chairs. Farther, the Common Reed makes excellent *weavers' combs*, and is generally nailed across the frame of wood-work, to serve as the foundation for plastered walls, pillars, &c.—From the dried roots of this plant, a very nutritive flour is easily obtained, which may be converted into wholesome and palatable *bread*. Its panicles are used, in Sweden, to impart a green colour to wool.

3. The *epigeios, (calamagrostis epigeios* of Withering) or Wood Reed, is perennial, grows in shady ditches, and moist situations, where it flowers in July.—This herb abounds particularly in the Isle of Ely, and is called by the inhabitants of the fens, *Maiden-Hair*:—it is manufactured into *hassocks*, or thick mats, for churches.

4. The *calamagrostis (lanceolata* of Dr. Withering) Small or Hedge-Reed, is likewise perennial;

rennial; grows in moist shady hedges, and meadows; where it flowers in the month of July. This species is remarkable for its beauty, and is an ornament to ditch-banks and hedges: it is rejected by cattle.—Prof. Pallas observes, that the panicles of the Small Reed, before the flower expands, impart a beautiful bright-green colour to wool, when boiled, with the addition of alum.

Reed, the Mace: See Cat's-tail.

Refining: See Distilling.

Regimen, of Invalids: See Debility.

RENNET, or Runnet, properly denotes the coagulated milky substance which is found in the stomachs of calves, that have received no other nourishment than the maternal milk. It is, however, generally applied to signify the stomach itself, which possesses equal properties.

The rennet commonly employed, consists of the inner membrane of a calf's stomach, which is cleaned, salted, and suspended in paper bags. Previously to its use, the salt is extracted by washing the rennet, which is soaked in a little water during the night; and, in the morning, the infusion is poured into the milk, with a view to coagulate this fluid. As the preparation now stated, greatly contributes to the superior quality of English cheese, the proper management of it ought to be conducted with the strictest attention to cleanliness: the reader will, therefore, find a receipt for making an excellent rennet, in the article Cheese, vol. i. p. 497.

It sometimes happens, however, that no rennet, sufficiently good for curdling milk, can be procured: hence various plants have been advantageously substituted, and found to answer the same purpose. The principal of these are the flowers of the Cheese-rennet, or Yellow Ladies Bed-straw (*Galium verum* L.) used in England; and the Cardoon (*Cynara cardunculus* L.) in Spain. A strong infusion is made of the *down* of the latter vegetable in the evening; and, on the succeeding morning, half a pint is poured among fourteen gallons of new milk, which is thus effectually coagulated, and in consequence produces a delicious cheese.

RESERVOIR, a place artificially constructed for the collection and retention of water, in order that it may be conveyed to distant places, by means of pipes.

Reservoirs are at present chiefly employed for the supply of fountains, *jets d'eau*, and similar volumes of water. Although such contrivances heighten the picturesque scenery of plantations, yet we conceive that they might be rendered productive of greater advantage to agriculturists, by forming them in certain situations, for the reception of *flood-waters*, and the prevention of many accidents, that happen in consequence of land-floods. Where the soil is naturally porous, and the strata, lying beneath, are so open as to absorb the rain-water during its descent, no floods will easily occur; because the fissures or pores operate as regulators for conducting the streams; and the discharge becomes so equal, that the humidity remains nearly in the same state throughout the year. In clay, and similar retentive lands, however, a very small portion of water is absorbed, and such large quantities speedily glide off the sur-

face,

face, so that either extreme scarcity or superfluity is the necessary result. With a view to remedy these inconveniencies in such soils, it has been proposed to form reservoirs of any depth, and breadth, that may be best adapted to the purpose; and, as during the heat of summer, the water would be absorbed to the depth of eight or nine inches, this diminution of its volume may be obviated, by raising the top so many inches higher than might otherwise be found expedient. Farther, such reservoirs may communicate, by means of subterraneous pipes or channels, with some rivulet or brook, that in summer is nearly dry; but which in the winter is swoln into torrents. In consequence of these hydraulic measures, a regular supply of water will be obtained at all seasons, for the irrigation of fields or meadows; and also for turning mills, or other machinery, where a certain velocity is required; so that the extensive damage frequently occasioned by sudden floods, will thus be effectually prevented.

RESIN, a viscid, tenacious juice, which either exudes naturally, or is obtained by incision, from different trees, and shrubs, such as the pine, fir, &c. It is somewhat transparent, hard and brittle, possesses a disagreeable taste; and is not soluble in water; though it may, in general, be dissolved in spirit of wine, and also in expressed and essential oils.

There are numerous resins, obtained from various trees, which differ in taste, colour, smell and consistence. Such are the Common Resin, Pitch, Mastich, Labdanum, Guaiacum, &c.; the properties of which are stated in their alphabetical series.

Considerable quantities of *Common Resin* are employed by salt-boilers, in combination with wheaten flour, to render the grain of salt smaller; and likewise by musical instrument makers, and musicians, for effecting greater vibrations by the bows of violins.—It has farther been conjectured, that resin might be so prepared, as to adapt it to the purposes of making *candles*. The Society for the Encouragement of Arts, &c. has accordingly offered premiums, several years successively; but no method of effecting such object has hitherto been discovered.—See CANDLES.

RESOLVENTS: See ATTENUANTS.

RESPIRATION: See BREATHING.

REST-HARROW, the THORNY, CAMMOCK, PETTY-WHIN, or GROUND-FURZE; *Ononis spinosa*, L. (the *arvensis* of Dr. SMITH) an indigenous perennial plant; growing on barren pastures, hedge-banks, and paths; it flowers in the month of July.—The young shoots of this plant may be boiled and eaten among culinary vegetables. Dr. WITHERING remarks, that a decoction of the roots has been recommended in cases of the stone and jaundice.—Cows and goats eat the Rest-harrow; though sheep do not relish it, and it is refused by horses and hogs.

REVENGE, is one of the most detestable passions that torment the human breast, and which consists in a vindictive desire of avenging real or imaginary wrongs. It widely differs from the transient or sudden resentment or indignation we feel at the first perception of an injury; and which, if it do not exceed the limits of moderation, is often commendable, nay, sometimes necessary for self-preservation. On the contrary, *revenge* is a deliberate and malignant vice, that is frequently committed, several years after the offence had been given.

This passion generally prevails in weak, uninformed, or immoral persons, who scruple not to exercise the most iniquitous reprisals:—in order to prevent such barbarous conduct, all civilized nations have enacted laws, for preventing the gratification of private malice. These, however, are too easily evaded; and a species of revenge, sanctioned by the *law of honour*, is suffered to exist with impunity, which is in all respects as mean and degrading as the practice of *pugilism*, while it produces consequences equally fatal.—See also, ANGER, DUEL, and WAR.

RHEUMATISM, a painful disease which principally affects the muscular parts, and larger joints of the body, in the direction of the muscles; such as the shoulder, hip, knees, &c.—If attended with fever, it is called the *acute* rheumatism; but, in the contrary case, the *chronic*: in the former, the pain generally shifts from one joint to another; in the latter, it remains in most cases fixed to a particular part. After the disorder has tortured the patient for some time, the joint is commonly swoln, red, and extremely painful to the touch.

As it is often difficult to distinguish *rheumatism* from *gout*, it should be remarked, that, in the former, the stomach is less affected; that the disease is more confined to the larger joints; that it occurs at an earlier stage of life; and that it is not hereditary. In young persons, the upper and internal parts *above* the midriff, but in the aged, those *below* the diaphragm, are more frequently liable to be attacked.—It is termed according to the seat of the malady: thus it is called *lumbago*, when seizing the loins; and *ischias*, or *sciatica*, when it rages in the hip. Rheumatisms prevail in cold climates, and mostly in spring and autumn; though they may appear at any season, in consequence of sudden alternations of heat and cold.

The inhabitants of this island, suffering frequently and severely from rheumatic complaints, we shall briefly enumerate the leading causes, from which they arise, namely: suppressed perspiration, by moist, cold air, especially at night; damp clothes; partial heat or cold; suppression of chronic eruptions; inhalation of metallic vapours; violent passions; and often too, after recovering from other disorders, such as fevers, fluxes, &c. in which cases it is generally *chronic*.

The *acute* rheumatism, in most instances, terminates between the seventh and fourteenth day, by perspiration, or urinary secretion, the sediment of which is copious, and resembles brick-dust: the *chronic* sometimes produces a looseness or eruption, but always requires a critical perspiration to remove it completely. When it, however, changes its place from the external parts, to any of the interior organs, where it lodges, the patient is always in danger.

Cure:—If the disease be attended with fever, every thing must be avoided, that may tend to irritate the system, or increase the violence of the circulation. The acute rheumatism being an inflammatory affection, the advice of the profession becomes indispensable; in order to determine upon the propriety or necessity of blood-letting, and whether this operation is to be repeated: beside which, it requires total abstinence from animal food; fermented and spirituous liquors; the use of a mild vegetable, or milk-diet; together with copious draughts of bland, diluting beverage. To avoid the debilitating effects of too frequent venesection, in cases of excruciating pain, especially when attended with swelling and redness, recourse may be had to *leeches* applied to the part, or to *cupping*. The principal relief is next to be expected from gentle sudorifics, when the perspiration should be promoted by lukewarm drink. If the disorder be transferred from the external to internal parts, blisters must be applied to the spot, which was previously affected: all other local applications, except warmth, are in such cases improper. After the complaint is removed, the patient should avoid all sudden changes of temperature, and at the same time apply friction to the parts formerly diseased.—During the whole affliction, it will be proper to preserve regularity of the bowels, by taking rhubarb, manna, flowers of sulphur, and similar laxatives, in small doses.

The chronic rheumatism is frequently consequent on the acute, when the latter has been mismanaged: hence it will be advisable to resort to such external and internal remedies, as may restore vigour to the parts, and promote the necessary evacuations, especially a proper state of perspiration. Gentle sudorifics, such as infusions of elder-flowers, white-wine whey, and ipecacuanha in small doses, have often procured relief; but the more active medicines, for instance, the *oil of turpentine*, *guaiacum*, and *antimonials*, must be cautiously *prescribed*. With the same intention, we shall observe, that the extract of the Large Blue Wolf's-bane (*Aconitum Napellus*, L.) has been found uncommonly efficacious in restoring perspiration, and dispersing the swelling; but, like other narcotics recommended for this purpose, it requires great circumspection.

As costiveness frequently retards the cure, it ought to be relieved by the mildest laxatives. The diet should, in general, be nourishing; and generous wine, moderately taken, will greatly conduce to recovery. The external means are, warmth by flannel worn next the painful part; frictions, vapour-baths, electricity, exercise, and the volatile liniment; but the other oils and unctuous preparations must be avoided; as they are apt to check perspiration, and thus to protract the disorder.—Lastly, blisters, and cataplasms of mustard, horse-radish, leaven applied to the suffering parts, or to their vicinity, have often proved beneficial.

The *Lumbago*, *Sciatica*, &c. being a species of the same disease, require a similar treatment; though the rheumatism of the hip may, in general, be successfully removed by a blister six inches long, and four broad, applied to the outside of the leg, immediately under the knee, and kept in a state of suppuration, till the pain ceases.

RHODIUM, an odoriferous essential oil, obtained from the wood of a species of the *Aspalathus*, or African Broom; and which has received its name from the Island of Rhodes, whence it is said to be imported.

Oil of Rhodium was formerly in

great repute as an astringent and corroborant; but, at present, it is chiefly employed in perfuming pomatums; and forms an ingredient in rat-powders composed of poisonous substances; as these noxious vermin are uncommonly partial to the agreeable scent of the drug.

RHUBARB, or *Rheum*, L. a genus of exotic plants, comprising seven species, of which the following are the principal:

1. The *rhaponticum*, or Common Rhubarb, a native of Thrace and Syria, which has long been cultivated in British gardens for the footstalks of the leaves, that are frequently used in pies and tarts. The root of this species is sometimes mistaken for the officinal rhubarb, from which it differs materially; as the surface of the former is of a dusky colour, its texture is more porous or spongy, and it possesses greater astringency than the latter, but is less purgative, requiring two or three drams, instead of fifteen or twenty grains of the powder, for one dose.

2. The *palmatum*, Palmated, True or Officinal Rhubarb, is a native of China and the East Indies, whence its culture has been introduced into Europe. It produces a thick fleshy root, externally yellowish-brown, but internally of a bright-yellow colour, streaked with red veins; and it endures the severity of our climate.

The officinal rhubarb is raised from seed, which should be sown early in February, in light, sandy soils, that have been previously ploughed to a considerable depth, and manured with a compost, consisting of one part of rotten dung, one part of sifted coal-ashes, and two parts of slaked lime, thoroughly incorporated with a proper quantity of mud, or mire taken from a mill-pond.—This species is also propagated, by planting buds or eyes in land thus prepared; which method is far superior to that before described; as a whole year is not only gained in the growth, but the plant is less liable to be injured by the depredations of vermin; and, in the course of four or five years, the *crowns* of the rhubarb will produce tolerably good roots; which, however, are neither so large nor so plentiful as those obtained from seed.

When the plants appear above ground, they will only require to be kept clear from all weeds; and, if the roots be covered with litter, or the earth be drawn around them, in the winter, they will vegetate with renewed vigour in the spring. Should they grow too closely together, it will be necessary to *thin* them, at the distance of five, or six feet; and, at the expiration of four years, the roots may be taken up for use; though their medicinal properties are supposed to increase, if they be suffered to remain in the earth for seven, eight, ten, or even twelve years.

The proper time for taking up the roots, in England, is from the middle of the summer to January; though they are sometimes dug out of the ground early in the spring; or in autumn, when the leaves are decayed. They are first washed clean, and the small fibres and external rind being pared or cut off, they are divided into pieces about one ounce in weight. In warm weather, they should be dried in the shade; but, if the season be cold or wet, it will be advisable to evaporate their moisture *gradually* in a hot-house, or an oven of a moderate heat; because, if dried too speedily, they will contract into wrinkles, and, if too slowly, they become mouldy, and unfit for use. Lastly, a hole is perforated in the middle, and the roots are suspended on packthread to dry, so that none of the pieces come in contact with each other.

The rhubarb, hitherto employed in medicine, is imported from Turkey, Russia, China, and the East Indies. The first sort is brought in roundish pieces, perforated in the centre; and which are externally of a yellow colour; but, on being cut, they appear variegated with bright-reddish streaks. The *Chinese* drug is imported in long pieces, which are harder and more compact than the Turkey Rhubarb; the former, possessing a weaker aromatic flavour, is less esteemed; though, being more astringent, it is, for some purposes at least, equal to the latter.

Rhubarb is justly prized as a mild cathartic, and may be safely administered to children, invalids, and delicate women, in doses of from 10 to 20 grains, though, in irritable, hysterical, and phthisical habits, it is apt to occasion gripes, and to aggravate febrile symptoms: hence it ought never to be given in the first stage of dysentery, when this invaluable remedy, by premature use, may occasion the most violent pain and inflammation of the bowels; but, after the fever is suppressed, and the disease becomes a chronic diarrhœa, small doses of rhubarb will be attended with the best effects. As, however, this medicinal root has a tendency to occasion obstructions of the intestines after copious evacuations, it will, in most cases, be proper to combine it with cooling salts, in order to prevent costiveness: thus, 6 grains of the former, and one dram of either Glauber's salt, or cream of tartar, in a combined state, may be taken with advantage in the evening, and a similar dose in the morning. In short, rhubarb is the only purgative we possess, that is, at the same time mildly astringent, diuretic, and does not relax the first passages.

Being an article of such importance in medicine, large quantities of this root are annually imported, to the amount of 200,000l.; which sum might easily be saved to the Nation:—various attempts have, therefore, been successfully made to introduce its culture into Britain. With this intention, the patriotic Society for the Encouragement of Arts, &c. have, for several years, distributed premiums for the cultivation and *curing* of the largest quantity of rhubarb. The successful candidates were, Sir WILLIAM FORDYCE, on whom they conferred a gold medal in 1784; Mr. THOMAS JONES, whom they rewarded with a similar premium in 1793, and with the farther sums of 30 guineas in 1798, and 1800; Mr. HAYWARD, on whom they conferred their gold medal in 1794; Mr. BALL, to whom they adjudged a similar reward in the same year, and a second in 1795; Mr. ROBERT DAVIS, and the Rev. JAMES STILLINGFLEET, on whom they severally bestowed gold medals in 1796 and 1797, for their respective exertions in cultivating and curing the true rhubarb. Their methods of management correspond, with a few exceptions, to that above stated; and it appears from authentic accounts, that sufficient quantities of this valuable drug may be reared in Britain; and that the English root has proved to be fully equal to the best sort obtained from Turkey and China.

Beside the utility of the roots, the seeds of such plants as are raised in England, possess a considerable portion of the medicinal properties of the former: its leaves impart an agreeable acidity to soups, similar to that of sorrel: a strong infusion in white wine, of pieces of the roots, that were not sufficiently thick for drying, has been given with great success in the dysenteries sometimes incident to cattle.—A marmalade is likewise prepared from the fresh stem, by stripping off the bark, and boiling the pulp with an equal quantity of honey or sugar. This, we understand, affords a mild and pleasant laxative, especially for children, to whom it is highly salubrious.—Lastly, Prof. PALLAS informs us, that M. SIEVERS, an apothecary, has discovered a resinous elastic gum, which, in the month of August, exuded from the leaves and flower-stalks of the Siberian rhubarb, on wounding them with a knife; and which bore perfect resemblance to the CAOUTCHOUC, or India rubber.—By a decoction of this root in alum-water, the Kirghis impart a beautiful orange colour to their leather and wool: a similar tint may be given to cloth; and, on adding green vitriol, a fine olive shade will be the result.—It has farther been conjectured, that, with a solution of tin, or bismuth, rhubarb would afford a beautiful red dye.

RIB-GRASS. See Ribwort PLANTAIN,

RIBS *(Costæ)*, in the human frame, are certain long bones of a semicircular figure. There are twenty-four in number, namely, twelve on each side the twelve vertebræ of the back, or the spinal column. They are divided into seven *true*, which are uppermost, and five spurious, or *false* ribs, which are softer and shorter; only the first of the latter being joined to the extremity of the breast-bone, while the gristly ends of the rest are combined with each other, and thus leave a greater space for the dilatation of the stomach and bowels. It is farther remarkable, that the cartilages throughout the ribs, are harder in the female than in the male subject, obviously with the view of enabling the former to support more easily the weight of their breasts;—that the last of the false ribs is perceptibly shorter than the rest, and is not joined to them, but in some persons to the oblique descending muscle;—that Nature has providently not constructed the ribs like the other solid, *articulated* bones; in order to admit of such a degree of expansion in the thorax or chest as is requisite to perform the important process of breathing. Hence, if in an easy inspiration the cavity of the thorax is raised 1-8th of an inch, and the midriff descends only $1\frac{1}{2}$ inches, it will afford room for 52 cubic inches of air to enter; so that, in an ordinary inspiration, the lungs are distended with 70, and sometimes 100, inches of atmospheric air.—Lastly, the ribs serve to defend the vital organs, and to impart adhesion to the muscles.

The principal casualties incident to the ribs, are *fractures*, and *luxations*. The former may be easily ascertained, on pressure with the fingers. The symptoms are seldom accompanied with aggravating circumstances, and the patient speedily recovers. If, however, the fracture be *compound*, or the bone depressed on the lungs, a very acute pain will be felt; breathing become difficult; and be attended with cough, sometimes with blood-spitting; while a full and quick pulse will indicate the presence of fever.—In such cases, it will always be proper immediately to apply for surgical assistance, and perhaps to lose a few ounces of blood. If one end of the rib be elevated, it ought to be reduced by moderate compression; and a broad leather belt should constantly be worn tightly around, for several weeks. Should any part of the rib be forced inwards, it must be carefully raised by the surgeon; and, if any air or extravasated blood be collected in the cavity of the chest, these fluids are to be timely and cautiously extracted.

Luxations of the ribs seldom occur. The symptoms correspond with those attending fractures, excepting that the pain is more acute at the articulation, which part alone will yield on pressure. In this case, the patient's body should be slowly bent over a cask, or a similar round vessel, in order to expand the ribs, and thus to reduce the luxated bone; as no bandages will afford any relief.—In all accidents of this nature, however, the patient ought to be kept on low and cooling diet; to avoid whatever may tend to irritate or disturb his mind, lest inflammation might ensue; and, if the cough be troublesome, it will be advisable to employ opiates (especially by means of unguents externally), with a view to allay its virulence.

RICE, or *Oryza*, a genus of plants consisting, according to LINNÆUS, of only one species, viz. the *sativa*, or Common Rice; though later botanists enumerate three or four species, each of which is divided into two varieties. It is a native of Ethiopia, and the East Indies, where it is cultivated to a considerable extent; as it constitutes the chief food of the inhabitants. They divide it into *six* kinds, which, however, may be reduced to the following two varieties, namely, 1. *Mountain-rice*, that grows on dry, elevated soils, manured with ashes; but, as the crops often fail, it is of a higher price than the next sort, and little known in Europe; tho' its grains are finer, whiter, more palatable, and may be longer preserved. Lately, this variety has with success been cultivated in Tuscany. 2. *Marsh-rice*, which is the usual kind sown in low, swampy districts, that may be easily inundated by means of sluices. Of this productive grain, large quantities are annually imported into Britain, and other parts of Europe; where it is highly esteemed for puddings and other culinary preparations. Being, however, too tender to be raised without the aid of artificial heat, in our climate, it can only be cultivated in hot-beds.—Some seeds of rice having, several years since, been sent to Carolina, its culture has so far succeeded, that it is now raised in that country in very considerable quantities.

Rice is, in the opinion of Dr. CULLEN, preferable to all other grain, both for its abundant produce, and the large portion of nutriment it affords. On account of its cheapness, it deservedly forms a principal article of food, for the poorer classes of society. Hence, different methods have been devised, of cooking or dressing it in the most economical manner. Thus, if a quarter of a pound of rice be tied loosely in a cloth capable of holding five times that quantity, and then slowly boiled, it will produce above a pound of solid food; which, eaten with sugar, or boiled milk, forms a very palatable dish. And, if an egg, together with a quarter of a pint of milk, a small quantity of sugar, and grated nutmeg, be added, it will afford a more agreeable pudding than those prepared either of wheaten flour, or bread. One of the best preparations of this grain, however, especially for invalids, is its mucilage or *jelly*; which may be obtained by boiling two ounces of fine rice-flour with a quarter of a pound of lump sugar, in a pint of water, till it become an uniform gelatinous mass: on being strained through a cloth, and suffered to cool, it constitutes a salubrious and nourishing food.

Rice also forms an excellent ingredient in preparing Bread; and, as we have already given a concise account (vol. i. p. 331) of one method in which it may be advantageously used, we shall now subjoin two receipts, by way of supplement. For this purpose, it is directed in the first vol. of the *Reports of the Society for increasing the Comforts of the Poor*, to boil a quarter of a pound of rice till it become perfectly soft; when it should be drained on the back of a sieve. In a cold state, it is to be mixed with three quarters of a pound of flour, a tea-cupful of yeast, a similar portion of milk, and a small table-spoonful of salt. This composition should be suffered to stand for three hours, at the expiration of which, it must be kneaded, and rolled in a little flour, so as to render the outside sufficiently dry to be put into the oven. In an hour and a quarter it will be baked, and produce 1lb. 14 oz. of good white bread; which, however, ought not to be eaten till it have been kept 48 hours.

In a late volume of the *Journal des Sciences, des Lettres, et des Arts*, we meet with an essay *on making bread from rice alone.*— The first step directed to be taken, is the reduction of the rice into flour, by grinding it in a mill; though, if such machine cannot be procured, it may be effected in the following manner: Let a certain quantity of water be heated in a saucepan, or other vessel; when it nearly boils, the rice must be thrown into it, and the whole taken off the fire, closely covered, and the grain suffered to macerate for twelve hours. The water is then to be poured off; and, when the rice is drained, and completely dried, it must be pulverized (it is not stated by what means) and passed through a very fine sieve.

The grain being thus converted into flour, a sufficient quantity is to be put into the kneading-trough: at the same time, a little rice should be separately boiled in water, till a thick and glutinous decoction be obtained. While this liquor is still lukewarm, it ought to be poured on the rice-flour, and both should be well kneaded together, with a proper quantity of leaven, or of yeast, and also with a small portion of flour; in order to impart to the whole a greater degree of consistence. Next, the dough is to be covered with warm cloths; and, when it is sufficiently risen (the oven having been heated during that interval), it should be poured into a tin stew-pan, furnished with a long handle, and covered with a sheet of paper, or with a cabbage leaf. The pan is then pushed forward into that part of the oven where it is intended to be baked, and expeditiously inverted. A proper degree of heat will prevent the paste from spreading, and cause it to retain the form of the vessel. In this manner, pure rice-bread may be made; which, when drawn out of the oven, is said to acquire a fine yellow colour, similar to that of pastry glazed with the yolks of eggs. It is very wholesome and agreeable, but loses its good taste, if it be suffered to become stale.

With respect to the properties of rice, we shall only observe, that it is uncommonly nutritive, and may with great benefit be taken in diarrhœas, dysenteries, and similar disorders. But it should not be eaten too frequently, or in too large quantities, by languid or debilitated persons; as it is apt to produce in them flatulency and costiveness. Hence it will, in general, be advisable to eat this grain with the addition of a little cinnamon, caraway, or similar spices, to prevent these disagreeable effects; especially in those whose digestion is slow, or who are naturally of phlegmatic habits.

RICKETS, a disease peculiar to infants from the age of nine months, to the third year; and which seldom continues till they attain to puberty. Its principal symptoms are, a large head, a prominent forehead, a relaxed skin, and swelling of the belly. The joints acquire an unnatural size; the bones, especially those of the legs and arms, become curved; and the cartilages of the ribs being deprived of their elasticity, are unable to support the chest; in consequence of which, it projects and grows deformed. In the progress of this malady, the belly is extremely tumid and hard to the touch, particularly on the right side; the teeth become black and carious; and the general emaciation is such as to leave the patient almost inanimate, having power only to move the neck and head.

The *proximate* cause of the disorder is now understood to be a *deficiency* of the *phosphate of lime,* or *animal gluten* in the *bones:* hence the latter are deprived of that necessary strength and solidity, in consequence of the prevailing debility in the vessels, so that the former, instead of being conveyed to the bones, is deposited in other parts of the body. Thus, we find particles of lime often evacuated by the urine, or sometimes lodged in the genitals.—See also BONES.

Among the *pre-disposing* causes, we shall briefly mention, the neglect of proper exercise, or what may be called *bad nursing*; frequent exposure to damp or mephitic air in close habitations; an improper system of living, with respect to food and drink; for instance, watery and mealy substances, particularly viscid pap, pastry, fish, salt-meat, and other articles, too difficult of digestion. Sometimes, however, it arises from the vitiated habits of parents; or is consequent on other diseases, such as small-pox, measles, &c.

Although the rickets do not, in general, prove fatal, when timely attended to, yet this affection is not unfrequently followed by a curvature, and even a decay of the bones, particularly those of the arms, legs, spine, &c.

In the cure of this malady, mild, opening, and strengthening medicines have been found useful: of the former, we recommend small doses of ipecacuanha, to act as a gentle emetic; rhubarb and manna, with the addition of nutmeg, or fennel-seed. Among the safest astringents, are quassia, Peruvian bark, and calcined zinc, in very small proportions, to be frequently repeated; but the cold bath, fresh air, and moderate exercise, are eminently beneficial. Iron filings, though considered a specific cure for this complaint, should be prescribed only by the faculty.

In the western isles of Scotland, the rickets are effectually cured by an oil, extracted from the liver of the skate-fish: with this intention, the wrists and ancles are rubbed with such oil in the evening, so that a fever of several hours duration is immediately excited. On the following evenings, the same operation is repeated, as long as the unction of those parts produces similar effects. When no febrile action can be induced by the friction of the wrists and ancles alone, they are then rubbed together with the knees and elbows; in consequence of which a new fever ensues; and this practice is continued accordingly. Then, the spine and loins are to undergo the operation, together with the former parts, to re-produce the symptoms of fever; and, when these likewise are no longer susceptible, a flannel shirt, dipped in the oil, is put upon the body of the patient; by which expedient a fever more violent than from any of the preceding applications is roused, and this general covering is worn next the skin, till the cure is completed; an event which generally takes place within a short time.—We have stated this *heroic* remedy, on the authority of Dr. DUNCAN, sen. of Edinburgh; who has inserted it in the 17th volume of his *Medical Commentaries*: but we apprehend, that few *English* parents will be inclined to submit their infants to this febrile stimulation; though we entertain no doubt of its efficacy, provided it be equally safe.

RICKETS, *in Sheep*, a disorder which occurs chiefly in the county of Huntingdon, whither it is by some farmers supposed to have been introduced from Holland.

This malady is one of the most fatal that can happen in a flock; for, as its causes have never been clearly ascertained, all the remedies hitherto employed for its removal, have uniformly failed of success.

The first symptom that indicates the presence of the rickets is, a species of giddiness, in consequence of which the sheep appears unusually wild and ferocious; starting up suddenly, and running to a considerable distance on the approach of any person, as if it were pursued by dogs.

In the second period, the chief characteristic is a violent and inflammatory itching in the skin; the animal rubs itself furiously against trees, hedges, and the like, so as to pull off the wool, and even to tear away the flesh: no critical discharge, or cutaneous eruption takes place, and every circumstance indicates the most violent fever.

The last stage of this malady, is the progress towards dissolution, which at length follows; and the animal, after having reeled about, lain down, and occasionally eaten a little, falls a victim to a general consumption.

The rickets appear in the spring; and are *hereditary*: thus, after remaining latent for one or two generations,

nerations, they break forth with increased violence. And, as they appear suddenly, the utmost precaution of the most judicious graziers cannot detect the malady; so that no other choice remains, but immediately to cease breeding from the infected flock.

Having already observed, that the cause of the rickets is unknown, it is to be apprehended that the aversion evinced by breeders, to make proper inquiries, will probably contribute towards perpetuating this veil of ignorance. Nevertheless, we deemed it useful to state the symptoms that indicate the disease: such of our readers, as may wish more fully to investigate this subject, may consult Mr. Comber's practical essay, entitled *Real Improvements in Agriculture*, &c. (8vo. 1s. 6d. 1772), in which it is amply discussed; and an account is given of the steps that have been taken to ascertain the cause and seat of the rickets in sheep.

RIDGES, in agriculture, are long but narrow tracts of rising soil, that intervene between two furrows.

Ploughing in *ridges*, is chiefly practised on wet lands; in order that the water may discharge itself into the furrows, and be thence conveyed by means of drains, or ditches, into some brook or rivulet. If the soil be deep, such ridges should be narrow; but, in shallow situations, they should be made broader; and, as the best or richest mould is collected in the tops, or crowns, it will be advisable to manure the sides; which, being necessarily rendered poor, would otherwise produce indifferent crops. Thus, the ground will become nearly of equal fertility, so long as the ameliorating properties of the dung or compost remain.

Great attention, however, is requisite, in forming ridges where the land is on a considerable declivity; for, if they be too steep, a heavy shower of rain would produce irreparable mischief. To obviate such accidents, they should, if practicable, be directed both north and south, so as to be on a gentle slope; and thus gradually to carry off the water. By such method, crops (the seed of which has been sown on the east and west sides) will be alike exposed to the enlivening rays of the sun, and consequently about the same time attain to maturity.—See also Furrow and Ploughing.

RIDING, in general, signifies the act of being carried along in any vehicle, or on the back of an animal.

Riding is one of the most useful species of exercise, particularly to convalescents and invalids; as it tends to clear the intestinal canal, to remove obstructions, to promote digestion, and to facilitate the discharge of crude matters. The most healthy mode of riding, is that on horse-back; but, if a person be weak and exhausted, it will be more advisable to employ a carriage. In all cases, however, the agitation ought to be moderate, one window in the coach being left open, so that respiration may not be impeded or confined.

The most suitable time for this exercise, in the summer, will be the morning, previously to partaking of any food; or about the middle of the day in the spring, autumn, or winter; but it should never exceed the space of one hour, or an hour and a half. Thus, the invigorating influence of the air will beneficially operate on the human system, and greatly contribute to the establishment of health.

RING-BONE, in farriery, denotes a hard swelling on the lower end of the pastern, generally extending half way round the forepart of the horse's leg: it is thus termed, from its resemblance to a *ring*.

This malady frequently arises from strains, and similar accidents; though, when affecting the hind-pastern, it is often occasioned by forcing young horses too early on their haunches. When the tumefied part is distinctly perceivable round the pastern, without affecting the coffin-joint, it is easily cured. But, if it originate from some strain or defect in this joint; or from a callosity seated under the round ligament that covers it; the cure is generally difficult, and sometimes impracticable; because the disorder is apt to degenerate into a QUITTOR-BONE, and eventually to form an ulcer upon the hoof.

Ring-bones occurring in colts and young horses, frequently disappear, without the aid of any application; and, while the substance remains tolerably sound, *blistering* will, in general, prove a sufficient remedy. But, if the swelling be of long continuance, and has become hard, it may then require both blistering and *firing*. In order to perform this operation with success, the iron employed, should be thinner than that commonly used for such purpose, and the lines or razes, must not be made above one quarter of an inch apart, crossing each other obliquely. A mild blister, extending over the cauterized parts, should next be applied; and, after having produced the desired effect, it will be requisite only to cover them with the common defensive plaster, which will in most cases complete the cure.

RING-WORM, or TETTER, *(Herpes miliaris)*, an eruption on the face, which consists of numerous small pustules, that rise closely in contact with each other; appearing generally in a circular form, and being attended with painful itching.

These pustules never suppurate, and cannot be easily cured; often breaking out at certain periods of the year, even after they have been apparently removed. The usual application, in this affection, is the common *black* or *writing-ink*; but frequent friction, or embrocation of the eruption with mushroom *catsup*, has sometimes been attended with success. The following preparation has likewise been recommended; though we have had no experience of its effects: Take the roots of wild or garden sorrel; let them be washed perfectly clean, bruised in a stone mortar, and steeped in strong white-wine vinegar, for two or three days. At the end of that time, the liquor will be fit for use, and the ring-worm should be rubbed with it three or four times in the course of the day, and every night, previously to retiring to rest; the roots being left in the vinegar as long as any of this liquid remains.

RIVER, a current or stream of fresh water, which flows in a bed or channel, from its spring or source, and empties itself into the sea.

Rivers form one of the chief ornaments of the globe; while they serve not only to carry off superfluous rains and springs; but, from the great numbers and varieties of fish they contain, likewise afford

afford a grateful food to mankind. They also greatly tend to fertilize the soils through which they flow; and the MUD, that subsides at the bottom, as well as the weeds which vegetate on their banks, form a valuable fertilizing MANURE. But, though rivers are thus beneficial to vegetation, they are easily swoln by sudden torrents, so that their banks burst, or overflow, and occasion irreparable injury. To prevent such dangerous accidents, it has been recommended to widen the courses, or passages of rivers, where they are narrow, or where the velocity of the current is otherwise obstructed: by this simple expedient, the sudden inundations of contiguous ground will be prevented; and the numerous flocks, &c. that in low situations are apt to be carried away, will be completely secured.

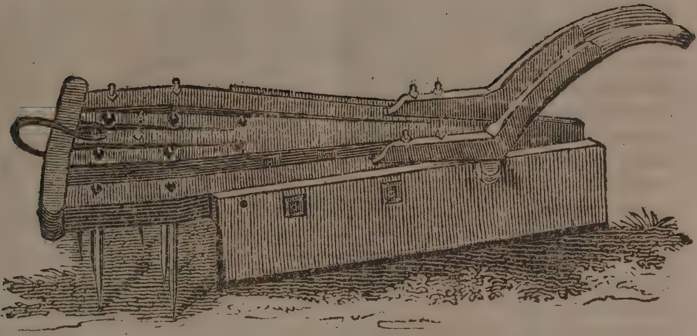
River-water is much softer, and better adapted to economical purposes, than that obtained from springs: for, though all rivers originate from the latter, yet, by the rapidity of their current, and their successive exposure to the sun and air, the earthy and metallic salts which they contain, are mostly decomposed; the acid is evolved; and the grosser or feculent particles are in a great measure precipitated. River-water, however, is more pure and salubrious, after having passed through gravelly or sandy soils, than if it flow over muddy or clayey beds; or glide through forests, or populous villages and towns, where it becomes impregnated with numerous impure vegetable and animal substances. In this turbid state, it is improper for domestic uses, and especially unfit for culinary supply; but, if it be suffered to subside, and be afterwards boiled and filtred, such water will become sufficiently clear and potable.—See also ALUM, (vol. i. p. 37); FILTRATION; and WATER.

ROACH, or *Cyprinus rutilus*, L. a well-known British fish, found in ponds, and still, deep rivers: its body is broad, though thin; the back much elevated, and sharply ridged; the scales are large and deciduous.

Roaches are gregarious fish, remarkably prolific, and active; but seldom attain to any considerable size. They are caught in a manner similar to DACE, and are much esteemed for their delicacy.

ROAD, an open way, or public thoroughfare, which forms a communication between two distant places.

Roads being frequently disfigured, and otherwise injured by the deep *ruts* which are necessarily made by the continual passing and re-passing of narrow wheel-carriages; various machines have been contrived, with a view to facilitate the repairing of highways, and to fill up such excavations.—From these, we shall first communicate the *Road-Harrow*, invented by Mr. HARRIOTT, to whom the Society for the Encouragement of Arts, &c. in 1789, voted a reward of ten guineas.—As this machine may not only be employed with great advantage, by the surveyors of public roads, but will also be found very serviceable in repairing and improving the private ways, or avenues, belonging to manors, we have annexed the following representation:



The model, from which this cut has been executed, is on the scale of two inches to one foot; so that the head of the harrow is three feet wide from one side of the bar to the other, externally. These bars are four inches square; five feet long; and, to prevent them from being split, they are contrived *lengthwise*, instead of being in a *transverse* direction. The mould-boards are four feet two inches in length, ten inches in depth, and two in thickness: they extend 11 inches beyond the bars, in order that the stones (which are brought to the surface by the teeth of the harrow) may be drawn into a smaller compass. These mould-boards are, farther, shod with an iron-bar, and lined with a plate of the same metal, to the height of the spot where they are marked *black*, in the cut above annexed; and such parts of this delineation, as are represented of a deeper colour, distinguish the iron from the wood-work. The teeth are one foot in length from the inferior side of the bars to their points, which ought to be steeled: they are $1\frac{1}{4}$ inch square, and are fixed by means of strong nuts and screws, with collars both on the upper and lower side of such bars.

Mr. Harriott's road-harrow is drawn by two horses abreast: the outside animal is led by a boy on that quarter; while the other horse walks in the proper path, and a man keeps the harrow steady by the handles; consequently they take one inside and one outside quarter in their progress, and the remaining two quarters in their return.

By this excellent machine, a man, boy, and two horses, may with ease repair three miles in length, in one day; harrowing down the quarters, and drawing the stones together, which are dropped into the ruts, by means of the mould-boards, in a more effectual manner than if they were *stubbed in* by a man. Lastly, the work is performed not only more expeditiously, but also at *one-tenth* part of the expence incurred, when the roads are repaired by *manual* labour.

In the 8th volume of the *Repertory of Arts*, &c. we meet with an account of a contrivance for preventing the wheels of carriages from making ruts in roads, by Robert Beatson, Esq.—This object is effected by fixing between the other wheels a *protector*, or small roller, or broad wheel: the circumference of its upper part should be about 1½ inch beneath the axle-tree, while the lower one ought to be at a similar distance from the ground. Such roller must be secured to the axle-tree, so as to be able to support the whole weight of the carriage, in case the principal wheels descend into any deep ruts. The size of the protector varies according to the proportions of these wheels; but Mr. B. observes, that two feet in diameter will be sufficient for *single carts*; and that *double carriages*, or waggons, will require it to be rather larger and broader. By thus elevating the roller a little distance above the lower surface of the wheels, the latter will, on good roads, support the weight of the load; and, if the middle or horse-path be firm, they cannot sink into old, or form any new, ruts; because the protector will roll in the middle, and thus afford an easier draught to the cattle. The additional weight of the machine, if it be properly constructed, Mr. Beatson conceives, will be inconsiderable; when compared with the utility of such contrivance, and the great reduction in the expence both of making and of repairing roads.—A more comprehensive account of this invention, the reader will find in the work above cited, where it is farther illustrated with an engraved figure.

Roan-tree. See Quicken-tree.

Roasting. See Cooking.

Rob. See Elder; vol. ii. p. 219.

Robin-Red-Breast. See Red-Breast.

Rock-salt. See Salt.

ROCKET, or *Brassica Eruca*, L. an exotic species of the cabbage, which was formerly cultivated to a considerable extent in gardens.—It is divided into two varieties, known under the names of the *Wild* and *Garden Rocket.*—This plant is propagated from seed, which is sown early in the spring: it flowers in the month of June. When used as a principal ingredient in summer salads, it is, on account of its pungency, always eaten together with endive, purslane, or similar cooling vegetables.

With respect to its medicinal properties, the rocket is aperient, and expels flatulency. Its seeds are remarkably acrid, resembling mustard in flavour; for which spice they have often been used as a substitute.—According to Bradley, it is an useful vermifuge; and, when boiled, and applied externally, is said to remove spots from the face.—Böhmer informs us, that both the seeds and flowers of this herb may, in times of scarcity, be converted into bread.

ROE, in ichthyology, denotes the eggs or spawn of fish.

The roes of male fishes are usually denominated *soft roes*, or *melts*; as those of females are known under the names of *hard roes*, or *spawn*.—Both vary in size, according to the fish from which they are obtained. Those of cod, for instance, when pickled, are greatly esteemed at the tables of the luxurious. Such rancid food, however, ought not to be eaten by the invalid, the convalescent, or otherwise debilitated; as, on account of its crude nature, and peculiar acrimony, it is very apt to cause indigestion, with all its numerous evils. But, if the epicure cannot abstain from dishes of this description, he ought to enjoy them with great moderation; to make use of *biscuits* instead of *new bread* (as is usually eaten at his table), and thus, in some degree at least, to correct the oily quality of the *roe*.—See also CAVIAR.

ROLLER, a well-known implement of agriculture, the cylinder of which consists either of stone, wood, or iron.

The principal design of *rolling* land, is to render loose soils more compact; by which means the earth adheres closely to the roots of plants, and their growth is considerably promoted. The season for performing this operation, varies according to the nature of the soil, and of the vegetables to be raised. Thus, it is an object of considerable importance, to roll wheat in the months of October and November, and from January till April, especially if the ground be loose; because the winter-rains frequently press the soil down, and thus leave the roots uncovered; and the autumnal rolling will prevent the ill effects of frost, as the spring-rolling will obviate those arising from droughts. Farther, it will be necessary to pass the machine over land sown with barley, directly after the seed is scattered. Oats, also, particularly on light soils, should be thus treated, immediately after sowing; but, in clay-lands, the operation ought to be deferred till the grain appear above ground. Lastly, all grasses may with advantage be rolled once, early in the spring; and, if it be practicable, a second and even a third time, after irrigation; because the earth will thereby not only be rendered more firm around the roots, but this management will also facilitate the future mowing.—See PASTURAGE.

ROOF. See BUILDING; vol. i. p. 385;—COUNTRY-HOUSE; REED; TILES, &c.

ROOK, or *Corvus frugilegus*, L. a well-known British bird, differing but little in size or colour from the common CROW; excepting in its whitish bill, which the former frequently thrusts into the ground, in search of grubs and earth-worms; whence it is destitute of feathers as far as the eyes.—Such distinction is the more necessary, because these birds frequently suffer on account of their resemblance to the crow: indeed, the rook, instead of being persecuted by the wanton sportsman, ought to be protected by every husbandman, who is sensible of the incalculable damage done to the fruits of the earth, by *chafers*, *caterpillars*, &c. notwithstanding the numbers that are destroyed by these industrious birds. They likewise feed on all sorts of grain, perhaps to some inconvenience to the farmer; but such injury is doubtless amply repaid by their services, in extirpating the pernicious grub, which, in some seasons, destroys whole crops of corn.

Rooks are gregarious birds, sometimes assembling in numerous flights; the places they frequent during the breeding-season, are called *rookeries*; for this purpose, they generally select a large cluster of the tallest trees, and groves, near the habitations of men; sometimes even in the midst of populous cities. In these aerial abodes, they establish a kind of fraternity, and exclude all strangers from becoming denizens of the spot.

Early in the spring, rooks begin to construct their nests; the external part of which is formed of sticks, but it is internally lined with fibrous roots; and the whole is regularly and substantially disposed. Their eggs are somewhat similar to those of crows, though rather less, and the spots are larger; the whole process of incubation, as well as feeding their young, is alternately performed by both the male and female.

The flesh of young rooks, when baked into pies, at an early season, is esteemed good eating, nay, little inferior to that of pigeons; but, with such intention, they ought to be previously deprived of their skins, as otherwise their flavour will be rank, and the taste uncommonly bitter.

ROOM, a chamber, parlour, or other apartment of a house.

The principal object to be attained in the arrangement of rooms, is, doubtless, conveniency, and their adaptation to health: hence the rectangular square, seems to be best calculated for this purpose; though a *cube* is not only the most agreeable, but also the most economical, figure. In large houses, however, the particular shape is of less consequence than the height of a room, which should be at the least 10 or 12 feet from the floor; as otherwise it may form a *spacious*, but cannot be considered a proportionate, or *healthy* apartment.

The elevation of rooms greatly depends on their figure. If they be constructed in a regular square, their height should, on architectural principles, not exceed 5-6ths, of the sides, nor be less than 4-5ths; but, in oblong chambers, it may be equal to their breadth.—A square room of a large size, is so far inconvenient, as the chairs, tables, &c. are too remote from the hand, so that they must be ranged along the sides of the room, when unemployed. Utility, therefore, requires a commodious apartment, to be a *parallelogram*; a figure well adapted for the admission of light.—Thus, to avoid cross-lights, all the windows ought to be introduced through one wall; for, if the opposite wall (as would be the case in *oblong* rooms) be at such a distance as not to receive sufficient light, the chamber will necessarily be obscure. Hence we may conclude, that utility and beauty, in the construction of substantial dwelling-houses, are with difficulty combined, nay often incompatible.

As the moisture and coldness of our climate, are formidable objections to high or *lofty* apartments; because they cannot, in the prevailing mode of warming them, be easily rendered of an uniform temperature; and as, on the other hand, *low* rooms are exeedingly unhealthy, we shall concisely state the substance of a patent granted in December, 1793, to Mr. JOSEPH GREEN, for a method of communicating warmth to rooms, and buildings, by means of heated air, supposed to be much purer than any that has hitherto been contrived.—For this purpose, the patentee employs a boiler, made of iron, copper, &c. within which is fixed one or more hollow vessels, or worms. The former vessel may be placed in any chamber, behind a stove or grate, so as to partake of a common fire; its size may be regulated by the extent of the apartment, or other place intended to be warmed; the steam is conducted in pipes, disposed in the most convenient manner, to the different rooms or other parts of the building. But, as this patent is not yet expired, the curious reader is referred to the 1st vol. of the *Repertory of Arts*, &c. where the whole process is minutely described.—See also AIR.

ROOT, in botany, denotes that part of a plant, which imbibes the nutritious juices from the earth, and conveys them to the stem, leaves, blossoms, and fruit.

Botanists have divided roots into three classes, according to their shape or figure, their situation in the ground, and their duration.

I. With respect to FIGURE, roots are either *simple*; *spindle-shaped*, as in the carrot; *bitten off*, as in the devil's-bit scabious; *bulbous* (see BULB, vol. i. p. 386); *tuberous*, as in the potatoe; *beaded*; *branched*; *hair-like*; *jointed*; *scaly*; *pendant*; *toothed*; *fasciculated*, or *bundled*.

II. The roots, which are denominated from their SITUATION, are either *perpendicular*; *horizontal*; *oblique*; *creeping*; *zig-zag*, or *inflected*; or such as put forth *suckers*.

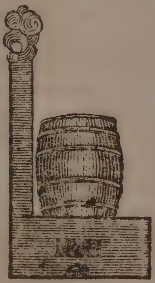
III. With regard to their DURATION, roots are either *annual*, that is, they flower and decay in one year; *biennial*, when they continue to vegetate two years; and *perennial* roots, are such as flourish for several, or at least more than two, years.

These essential parts of plants greatly contribute to the comfort, and to the benefit of mankind; as many of them not only afford wholesome and nutritious food, but are of considerable utility in medicine. Several roots also impart colours, which are employed both in arts and in manufactures; and are, in general, more durable than those obtained from the plants. Thus, the expressed juice of the common radish, when combined with tobacco-pipe clay and a little alum, yields a blue of considerable permanency and brightness.

Notwithstanding their tinging properties, however, the generality of roots is *etiolated*, or perfectly white, in consequence of their seclusion from the light. This phenomenon, in the opinion of Dr. DARWIN, arises from the liberation or evolution of their superfluous oxygen, which unites with the colouring matter, and converts the latter into a colourless acid; excepting in such roots as contain too large a proportion of the dyeing substance, for instance, in the madder; the roots of which, externally, are red, while the internal part is yellow.—See also LIGHT.

ROOT of SCARCITY. See MANGEL-WURZEL.

ROOT-STEAMER, an useful machine, employed in America, for steaming potatoes, carrots, and other roots, with the view of feeding cattle; and which, for the simplicity of its contrivance, and the facility with which vegetables may thus be prepared, deserves to be more generally known in Britain. We have therefore subjoined the following representation:



The apparatus here delineated, consists of a brick-stove, in which a pot or kettle is fixed: over this

boiler

boiler is placed a hogshead or cask, the top of which is open (we believe it might with more advantage be covered with a coarse cloth); while the bottom is drilled with numerous holes, about one inch in diameter; so that the steam may freely pass through the roots. In this vessel, the potatoes, &c. after being washed, are deposited; and, when sufficiently steamed, they afford a more invigorating and fattening food to cattle, than in a raw state.

ROPE, a continuation of several twists or strings of hemp, combined by means of a wheel, and in that state employed in various branches of naval, military, and civil architecture, as well as in rural and domestic economy.

Ropes may be manufactured of all vegetable substances that are sufficiently fibrous, tenacious, and pliant. Thus, the stems of aloes, the fibrous covering of cocoa-nuts, bamboos, and the leaves of the common Spanish nut-grass (*Lygeum spartum*, L.), are, in the East Indies, advantageously converted into ropes. The barks of the Linden-tree, Willow, Bramble, &c. are employed for the same purpose in Europe; but the most durable and flexible materials hitherto discovered, are flax and hemp, the latter of which is preferred for all cordage employed for raising great weights.

From the multifarious purposes to which ropes are subservient, their manufacture is an object of considerable importance: our limits, however, permit us only to mention such patents as have been obtained for making or working them to the greatest advantage, and which have not already been stated, under the article CORD.

In March, 1793, a patent was granted to Mr. JOHN DANIEL BELFOUR, for a new invented machine in the manufacture of ropes and cordage. The object of this contrivance, is the improvement of the common method, by making every *yarn* bear an equal proportion of the strain or weight: for this purpose, each yarn is wound on a separate reel, which is so constructed as not to yield, or part with, the former, till it is unwound in its rotation, with a view to contribute its proportionate assistance in forming the *strand*.—As the construction of this machine is interesting chiefly to rope-makers, we forbear to describe it, and refer the inquisitive reader to the 2d vol. of the *Repertory of Arts*, &c. where a full specification is given, and illustrated with an engraving.

In November, 1798, another patent was obtained by Mr. JOHN CURR; for a method of manufacturing *flat ropes*, to be used in drawing coals, water, &c. from any mine or pit. Such ropes may be made, by connecting two or more cords or small ropes *sidewise*, by sewing or interweaving them with thread, or cordage made of hemp, flax, or other materials; or with brass or iron wire; so as to prevent them from separating, and to form a broad rope. The patentee observes, that this sewing or stitching may be effected in different ways; and that his machine will be found eminently useful, and expeditious; but, as a mere description will not convey an adequate idea of its mechanism, the reader will consult the 10th volume of the work above quoted; in which it is fully described, and exemplified by a plate.

ROSE, ST. ANTHONY'S FIRE,

or *Erysipelas*, is an inflammation and swelling of the skin, which disappear upon pressure, but suddenly return; being attended with an ardent fever, the principal symptoms of which are drowsiness, and sometimes delirium. It frequently attacks the face, though other parts are not exempt from its influence.

This eruptive disorder is very apt to change its place on the human body. In its progress, the redness extends over the contiguous parts, and usually vanishes from those previously affected. The inflammation, however, does not produce any remission of the fever, which, in some instances, even increases during the progressive eruption; and, in general, continues for eight or ten days. When the inflammatory symptoms have prevailed for some time, vesicles of various sizes, containing a thin yellowish liquor, are usually observed to arise on different parts. Though the surface of the skin, thus blistered, sometimes assumes a livid hue, this circumstance is by no means alarming. On the contrary, the sound surface of the skin, scales off towards the end of the disease. If no delirium, or other affection of the brain intervene, the event is generally favourable; but persons, who have once been attacked with the *Rose*, are liable to frequent returns, especially in the spring and autumn.

Causes:—Violent passions; irregular secretion of the bile; suppression of habitual evacuations, such as piles and bleedings; external injuries; acrid and coarse food, difficult of digestion, &c.

Hence, we recommend to persons who are pre-disposed to this affection, a rigid abstinence from fat and viscid provisions, particularly pickled, dried, and high-seasoned dishes: they should adopt a cooling, light, and vegetable diet, their beverage consisting of a mild white wine; the good effects of which will be greatly promoted by moderate exercise, and taking one or two drams of cream of tartar in a glass of water, every night, on retiring to rest.

Cure:—The principal attention must be directed to the inflammatory stage of the disorder. It will, therefore, be indispensably necessary to refrain from all animal food, spirituous liquors, &c.—In the beginning of the complaint, copious decoctions of dried elder-flowers, with a few grains of nitre dissolved in the liquor, will be of great service; beside which, the bowels ought to be opened by mild, cooling laxatives. If, in the progress of the disease, a foul stomach should be observed, without excessive febrile heat, an emetic may be taken with advantage.—Blood-letting must not be attempted without due precaution; as it will be proper only in cases where the brain is affected by the fever. But, if the disease be attended with general debility, bark and wine must be immediately and freely administered. Should, nevertheless, symptoms of mortification appear, the treatment, stated under the article Gangrene, will be generally found effectual, in checking its progress.—Having, on many occasions, witnessed the bad effects of moist or unctuous applications, in the *true Rose* (though Kirkland and others have indiscriminately recommended them), we cannot omit this opportunity of cautioning the reader against such practices. According to our experience,

perience, *dry* and *warmed wheaten flour*, often strewed on the parts affected, or thin linen bags, stuffed with equal parts of oatmeal and chamomile flowers, together with a few drams of coarsely pounded camphor, have uniformly been attended with the desired effect. These external remedies contribute to relieve the tension, and inflammatory state of the skin, while they allay irritation, and, in a manner, absorb the exhaling noxious matter; whereas, lotions and unguents of every description, only aggravate the disorder, by clogging the pores, and exciting a degree of re-action; which cannot fail to be hurtful, especially when accompanied with the slightest friction, either of the fingers, or even a piece of cloth.

ROSE, or *Rosa*, L. a genus of shrubs, consisting of 25, but, according to some botanists, of 90, species, of which the following are the principal, though the first five only are indigenous, namely:

1. The *canina*. See DOG-ROSE.

2. The *spinosissima, v. pimpinellifolia*, BURNET ROSE, PIMPERNEL, or SCOTCH ROSE, grows on heaths, in thickets, hedges, and the borders of fields, in sandy situations: it flowers in the month of June or July.—This species, on account of its low growth, and the singular beauty of its diminutive leaves, which resemble the Upland Burnet, deserves to be cultivated in every garden. Its ripe fruit is eaten by children, and has a grateful, sub-acid taste. The juice, if diluted with water, dyes silk and muslin of a peach-colour; and, with the addition of alum, it imparts a deep violet; but it has very little effect either on wool or on linen.—See also TEA.

3. The *arvensis*, WHITE-FLOWERED DOG-ROSE, or CORN ROSE, is found in hedges and heaths, particularly in the west of Yorkshire. It grows to the height of five or six feet, and has whitish blossoms, armed with prickles bowed downwards: the former appear in July, and are succeeded by red berries; the beauty and fragrance of which have introduced it into our gardens.

4. The *villosa*, or APPLE-ROSE, grows six or eight feet high, in mountainous hedges and shady places, being very common in the north of England. Its large single red flowers blow in the month of June, and are succeeded by round prickly *heps*. In a cultivated state, this species often attains the height of ten feet, and its fruit the size of crabs: hence it deserves a place in every large garden, both for the singular beauty and also for the utility of its berries; which has an agreeable acid pulp, that forms a proper ingredient in sweet-meats.

5. The *rubiginosa*, SWEET-BRIAR, or EGLANTINE, abounds in hedges, where it is often five or six feet high: its small red flowers appear in the months of June and July.—There are numerous varieties of this species, the principal of which are known under the names of Common Single-flowered, Semi-double flowered, Blush-double flowered, and Yellow-flowered Roses.—The Sweet Briar is generally cultivated in gardens, chiefly in the borders of walks, and contiguously to dwelling-houses; where its fragrant leaves diffuse a grateful odour.

6. The *Gallica*, or FRENCH ROSE, an exotic species, which is commonly raised in Britain, on account of its beautiful red flowers.

It has almost endless varieties, the enumeration of which would swell this article to a disproportionate length. We shall therefore only state the following, viz. the Common Red Rose, with large, spreading, half-double, deep-red flowers. —The *Rosa mundi*, or Rose of the World, which has large expanding, semi-double red flowers, beautifully variegated with white streaks. —The York and Lancaster Rose grows to the height of from six to eight feet; and has elegantly striped white and red flowers.—The Monthly Rose is from four to six feet high, with green prickly shoots, producing numerous party-coloured flowers from May to August, and a second time, if the season be mild, from September or October to December.

7. The *centifolia*, HUNDRED-LEAVED or DAMASK ROSE, is justly termed the *Queen of Flowers*, and has long been an ornament to British gardens, both for its elegance and fragrance. There are several varieties, known under the names of the Provence, Royal, Common Dutch Hundred-leaved, Blush Hundred-leaved Roses, &c. —The damask rose yields, on distillation, a small portion of butyrous oil, together with a water, which possess the odour and taste of the roses, and are greatly esteemed for the agreeable flavour they impart to culinary preparations, and also to cordials. They are strongly recommended by HOFFMAN, as being singularly efficacious in exciting the strength, invigorating the spirits, and mitigating pain. Beside these properties, a decoction of its leaves, after being distilled, has a mildly purgative quality; and which, on mixing it with sugar, forms an agreeable laxative syrup, and may with advantage be given to children.

All the species of roses are hardy, deciduous shrubs, and thrive in any soil or situation; though they flourish best in moist open lands. They are easily propagated by suckers and layers; which, when planted, require only occasional pruning of their dead and superfluous branches, as well as the removal of their suckers, every autumn.

OTTAR, or ESSENCE of ROSES, is a valuable perfume, obtained from these flowers by distillation; it may be prepared in the following manner:—Let a quantity of fresh roses be put into a still, with their flower-cups entire, together with one-third of their weight of pure water. The mass is now to be mixed with the hand, and a gentle fire kindled beneath. When the water becomes hot, all the interstices must be well luted, and cold water placed on the refrigeratory at the top.—As soon as the distilled water *comes over*, the heat should be gradually diminished, till a sufficient quantity of the *first runnings* be drawn off. Fresh water is then to be added, which should be equal in weight to the flowers, when the latter were first submitted to the still; and the same process repeated, till a due portion of *second runnings* be procured. The distilled water must next be poured into shallow earthen, or tin vessels, and exposed to the air till the succeeding morning, when the ottar or essence will appear congealed on the surface. The latter is now to be carefully skimmed, poured into phials, and the water, strained from the lees, should be employed for fresh distillation; the dregs, however, ought to be preserved,

served, as they contain an equal degree of perfume with the essence.

Such is the process followed in India, where this costly drug is frequently adulterated, by distilling the raspings of sandal-wood with the flowers; but the fraud may be easily detected by the smell, and also by the fluidity of the oil of sandal; which will not congeal on exposure to the air.—The true *ottar of roses* is sold in the East Indies at the exorbitant price of *twenty guineas*, and upwards, *per ounce*. It is doubtless the most elegant perfume in vegetable nature; as a single drop imparts its fragrance throughout the room or dwelling, and suppresses other less agreeable odours. Lastly, there is a conserve, syrup, and vinegar of roses prepared in the shops; though the first two only are generally sold.

ROSE-BAY, or *Nerium*, L. a genus of exotic plants, consisting of five species, the most remarkable of which are the following, viz:

1. The *Oleander*, or South Sea Rose, a beautiful shrub, cultivated in gardens on account of its fine purple flowers; it is propagated by planting layers in rich, moist situations. We cannot, however, recommend its culture; as the whole plant is poisonous, and especially the roots. Its juice, if inadvertently swallowed, excites so great an inflammation as immediately to prevent deglutition; while it operates most powerfully as an emetic and purgative. Farther, the odour of the flowers, if they be handled or kept in close apartments, is attended with injurious effects; as it gradually excites numbness and acute pain in the head.—The proper antidotes are copious draughts of vinegar, and other vegetable acids.

2. The *anti-dysentericum*, a native of Ceylon, which is not cultivated.—The bark of its root, when grated and infused in water, is said to be of great service in the dysentery.

3. The *tinctorium*, or Dyer's Rose-bay, is a native of Madras, in the East Indies. It has beautiful blue flowers; and a decoction of the leaves, together with the addition of lime, produces a very fine indigo.

ROSEMARY, or *Rosmarinus officinalis*, L. an exotic plant, consisting of two varieties:

1. The *angustifolia*, or Narrow-leaved Rosemary; and,

2. The *latifolia*, or Broad-leaved Rosemary.

Both these species are natives of the warmer climates of Europe, where they flourish on dry rocky soils, contiguous to the sea; and are also cultivated, on account of their medicinal properties, in the gardens of Britain; the climate of which they endure, provided they be planted on poor, dry, and gravelly lands.—They may be propagated either by cuttings, or by slips.

Rosemary possesses a fragrant odour, together with a pungent and somewhat bitter taste, resembling that of lavender. The leaves and young tops are the strongest; and from both, as well as the flowers, an essential oil is prepared; or, when distilled with spirit of wine, they afford the celebrated *Hungary water*. These liquid medicines are esteemed excellent cephalics in nervous and hysterical affections; and have been found eminently serviceable in apoplexies, palsies, and vertigoes; in which cases, they are sparingly applied to the temples and forehead. According to some writers, they also afford considerable relief to persons troubled with a fetid breath, when employed in gargarisms and dentrifices, diluted with old or long kept spirit of scurvy-grass; while they are supposed to improve the organs of sight.

ROSE-WORT, the YELLOW, or ROSE-ROOT, *Rhodiola communis v. rosea*, L. an indigenous plant, which grows on rocks, and in mountainous situations; it flowers in the months of June and July.—The perennial root of this herb is white, juicy, and possesses the fragrance of roses in so remarkable a degree, as to perfume the atmosphere, especially in Lapland. Its rosy odour is preserved in a dry state: hence it may be usefully employed for distilled waters. The Greenlanders eat the fresh root among culinary vegetables; but, when cultivated in a garden, its odoriferous properties are greatly diminished.—The plant is relished by goats and sheep, but rejected by cows and hogs.

ROT, a very fatal disorder, which exclusively affects sheep. It is known by the dullness of the animal's eyes; the livid hue of the gums; foulness of the teeth; the ill scent of the breath; and the facility with which the wool, and, in the last stage, the horns may be pulled out, or separated from their roots.

Various causes have been assigned for the origin of this malady; but the prevailing opinion appears to be, that it arises from the feeding of sheep in too moist or wet lands; though it is certain, that the dry limed land in Derbyshire will produce the rot, as well as watery meadows and stagnant marshes. The anonymous author of the *Farmers' Calendar*, conjectures that it is occasioned by a peculiar species of dropsy, incident to deer, rabbits, and sheep, which, however, originates from superabundant moisture. An ingenious correspondent, in the 1st vol. of the *Letters and Papers of the Bath and West of England Society*, attributes it to the FLEUKWORMS that breed in the livers of sheep, whither they are conveyed through the nostrils, while the animals are grazing. Lastly, Dr. DARWIN suspects the rot to proceed from the inactivity of the absorbent vessels of the livers in sheep, so that the bile becomes too thin or diluted, especially in moist seasons.

Such diversity of opinion is not easily reconciled; but, as the general *predisposing* causes obviously consist in too moist food, or damp and wet situations, it follows that *moisture* may be considered as the principal source of the rot.

The remedies contrived for the prevention and cure of this distemper, are as various as the conjectures respecting its origin. MILLER recommends PARSLEY, as being eminently serviceable.—Mr. VARLO (*New System of Husbandry*, vol. i.) directs one spoonful of common SALT to be given once in the week, to each animal, when a "rotting season" is apprehended; and, as soon as the sheep are accustomed to it, he advises some dry salt to be laid on flat stones, in different parts of the pasture; as they will spontaneously lick it up, without any farther trouble.—Mr. PRICE (in the vol. of the *Letters and Papers*, &c. above quoted) recommends every farmer to remove his sheep, in wet and warm seasons, from such lands as are liable to occasion the rot; but, if this be impracticable, he prescribes a spoonful of common salt for each, together with a similar quantity of flour, in a pint of water, once or twice in the week, by way of preventive: and, if the disorder be in an incipient state, a similar dose administered four or five successive mornings, will, in his opinion, probably effect a cure; as the addition of the flour and water not only abates the pungency of the salt, but also disposes it to mix more gradually, though at the same time more efficaciously, with the chyle. Dr. Darwin, however, thinks the salt would be more serviceable, if it were combined into a ball with about sixty grains of iron filings, by means of flour, and introduced into the sheep's throat every morning, for one week.

The following remedy we state on the authority of the *Gentleman's Magazine*, vol. 36, for 1766:—Put a handful of rue into a pail of water, over-night; and, in the morning, add such a proportion of salt as will make a brine sufficiently strong to support an egg. Half a pint of this liquor must be swallowed by each sheep, three times, in the course of six days; that is, every 48 hours one dose.

In October, 1794, a patent was granted to Mr. Thomas Fleet, for a medicine which is affirmed to prevent the rot in sheep, and also to check the farther progress of the disease in animals already infected; so as to render them capable of being fattened on the same herbage which produced the distemper. His *restorative* consists of turpentine, Armenian bole, turmeric, mercury, salt, sulphur, opium, alkanet-root, bark, camphor, antimony, and distilled water. These ingredients are to be prepared "according to chemical, and compounded according to medical art."—Although the patentee has not deemed proper to inform the public of the proportions employed in compounding these multifarious ingredients, yet it deserves to be remarked, that in such a mass of different drugs, the principal effects will be produced by a *few*, while the others are added only with a view to disguise those, which are more efficacious. Hence we believe, that a few grains of muriated quicksilver, combined with camphor, and opium, if judiciously administered, would answer a similar purpose; but, in order to convince those readers who wish to purchase Mr. Fleet's preparation, that we are not prejudiced against *Quack or Patent Medicines for Cattle*, it may be useful to add, that the "Restorative for the Rot in Sheep," is prepared by W. H. Thomas, surgeon, Basingstoke, Hants; and, we understand, is sold by him, as well as by W. Moore and Co. No. 80, Fleet-street, London, at 5s.6d. per bottle, with printed directions for its use.

ROTTEN-STONE, a fossil obtained from the mines of Derbyshire: which is of an ash-brown colour, moderately hard, and stains the fingers. It does not effervesce with aqua-fortis; but breaks easily in the mouth, or in water.—This mineral is used by lapidaries and other mechanics, for grinding, polishing, and sometimes for cutting stones.

ROUEN, or Rowen, a term denoting the *aftermath*, or after-grass of meadows, which is suffered to grow till the ensuing spring, when sheep and other cattle are admitted to depasture on such land.

The practice of reserving the aftermath, or second crop of grass, is recommended by the most able agriculturists; as the cattle feeding on it are not only more healthy, but thrive much better than if they were supplied with turnips, cabbages, potatoes, or other food.

It would exceed our limits to enumerate all the advantages arising from *rouen:* we shall, therefore, only observe, that the dependence is by no means precarious. Indeed, Mr. YOUNG (*Annals of Agriculture,* vol. xxiii.) is so decidedly convinced of the superior advantages arising from this practice, both in the quality and quantity of the food, that he declares, he should labour "under very heavy difficulties, if he was deprived of this resource, with so numerous a stock on the farm."

ROWEL, in farriery, signifies a kind of issue, artificially formed in horses, with a view to drain superfluous humours.

Rowels are introduced into the abdomen, the inside of the thighs, the breast, and outside of the shoulders and hips of a horse. The operation is performed by an incision through the skin, about 3-8ths of an inch in length, then separating it from the flesh with the finger, or passing an ivory folder around the orifice: next, a thin piece of leather, of a circular shape, about the size of a silver crown piece, should be provided, and a large round hole made in its centre. Before the leather is introduced between the skin and muscles, it must be partially covered with lint or tow, and immersed in some digestive ointment: a pledget of tow is likewise dipped in a similar unguent, and carefully put into the orifice, so as completely to exclude atmospheric air. The parts around it soon swell; a copious discharge of yellow serum or water follows; and, in two or three days, at the farthest, the matter will appear thick, gross, and white, when the rowel is said to *suppurate.*

Although these issues are doubtless of great service in some cases, yet, like many other operations injudiciously practised on horses, they sometimes injure their constitution; and, instead of suppurating, become *gangrenous.*

Rowels are eminently useful in carrying off rheums or defluxions from the eyes; in great swellings of the glands, about the throat and jaws, which sometimes threaten suffocation. In the vertigo or staggers, apoplexy, and in large tumors arising suddenly on the legs, heels, &c. when attended with a discharge of thin ichorous matter; as well as in a variety of other disorders, the application of this remedy should be determined by the Veterinary Surgeon.—See SETONS.

RUBY, a genus of precious stones, which display a variety of shades, and are divided into four classes: namely,

1. The *deep-red* ruby, is found in various parts of the East Indies, and also in Brazil.

2. The *spinell,* the shade of which resembles that of a bright corn-poppy flower: it is dug out of the mines of Hungary, Bohemia, Silesia, and South America.

3. The *balass,* or pale-red ruby, inclining to a violet, is supposed to be the mother of the different species of these gems. It is imported

principally from Brazil, though a few are sometimes brought from the East Indies.

4. The *rubicell* is of a reddish-yellow, and is likewise obtained from the Brazils.—There is a variety of this gem found, in considerable numbers, on the sea shore, near Ely, in the county of Fife; also near Portsoy, Banffshire, and at Inverary, Argyleshire, in Scotland.

Rubies are held in great esteem, on account of their lustre, and the beauty of their *water:* hence they are sold at high prices, and often counterfeited by Brazilian topazes, which are gradually heated in a crucible previously filled with ashes, till they become red-hot.

Rubies, when imported, are subject to no restrictions of entry, registry, &c. as they pay no duty whatever.

RUE, or *ruta,* L. a genus of exotic plants, comprising seven species, the principal of which is the *graveolens,* or Common broad-leaved Garden Rue. It flowers in the month of June.

This plant is, for its medicinal properties, often cultivated in gardens. It has a strong odour, and a bitterish pungent taste. The leaves are very acrid; and, when in full vigour, are apt to raise blisters on handling, or applying them to the skin. Boerhaave recommends them as powerful stimulants, attenuants, and detergents: hence they are reputed to be of great service to persons of cold, phlegmatic habits; as they quicken the circulation; dissolve viscid or tenacious juices; remove obstructions; and promote the fluid secretions. "What medicine," says he, "can be more efficacious for promoting sweat and perspiration; for the cure of the hysteric passion, of epilepsies; and for expelling poison?"—Nevertheless, the *rue* has lately been seldom prescribed, probably because many absurd and superstitious notions prevail respecting this herb, in domestic life.

RUE, the Meadow, or *Thalictrum,* L. a genus of plants, comprising twenty-three species, four of which only are indigenous: the principal of these, is the *flavum,* Common Meadow-rue, Spurious Rhubarb, or Rue-weed: it is perennial, grows in moist meadows, pastures, and on the banks of rivers; where it flowers in the month of June.

The root, branches, and leaves of this plant, impart to wool a yellow colour; which, on adding sal-ammoniac, assumes a pale shade; and, on dropping oil of tartar into the decoction, acquires an orange colour; but, in order to give it lustre, the cloth should be immersed in alum-water; and the tint itself may be fixed, by dissolving cream of tartar in the last liquor. A cataplasm prepared of the leaves, is said to have afforded relief in the *Sciatica:* See Rheumatism.—From the yellow flowers, bees extract a large portion of honey.—Cows, horses, goats, and sheep, eat the Meadow-rue; but it is disliked by hogs.

END OF VOL. III.

Printed by B. M'Millan,
Bow-Street, Covent-Garden.